GOVERNMENT OF INDIA

MINISTRY OF TRANSPORT AND COMMISSION

DEPARTMENT OF TRANSPORT

SHIP REPAIRS COMMISSION

REPORT

सत्यमेव जयते

1959

CORRIGENDA

(SHIP REPAIRS COMMITTEE REPORT, 1959)

Page 1 Para 1.1. line 15 for 'T.B.Bose, I.N.' read 'Capt. T.B. Bose (now Rear Admiral) I.N.'

Page 33 Para 8.8.1 line 9 for 'from to ship' read 'from shop to ship'.

Page 101 Insert the following under the column Page No. and against the Annexure Nos.

Annexure	Page No.
I	102
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Pages 126/127 The figures in columns 6-11 against certain items be substituted as shown against each in the statement attached.

Page 145 Last but one line, for 'Targes' read 'Barges'.

Pages -126/127-

	6	7	8	9	10	11
Air Compressors	20	4	4 Portable	Nil	2	Nil
Stationery	13					
Mobile	-					
Wood Working Machines.	4	20	1	Nil	2	Several
Shearing Cutting Punching & Bending Machines.	7	16	4	1	4	2
Power Presses.	2	Nil	Nil	Nil	Nil	1
Overhead cranes in w/shop.	1	8-2 Hand operated 6 elec.	2-5 Tons	Being installed	Nil	Nil
Crankshaft Grinding Machine	Nil	Nil	Nil	Nil	Nil	Nil
Testing Machine	Nil	1 Hardness testing	1	2 also buoyancy tank testing.	Nil	Nil
Galvanizing Plant	Yes-one	Nil	Nil Also 3 drilling machines	Nil Also drilling machines.	Nil	Nil

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CHAPTER I

INTRODUCTORY

1.1. **Appointment and composition of the Committee.**—The proposal to appoint a committee to enquire into the question of improvement of ship repair facilities in Indian ports appears to have been mooted originally in 1957, and a reference was made to this proposal in Parliament by the then Minister for Transport and Communications during the discussions in the budget session of that year. The appointment of our Committee was, however, actually announced in a Resolution of the Government of India which was published in the Ministry of Transport and Communications Notification No. SY-1(2)/57, dated the 22nd January, 1958. Shri O V Alagesan was appointed as the Chairman of the Committee and the following were appointed as members.

Shri Amarnath Aggarwal.	..	Member, Rajya Sabha.
Shri Narendra P. Nathwani.	..	Member, Lok Sabha.
T. B. Bose, I.N.	..	Chief Surveyor with the Government of India.
Captain T. N. Kochhar, I.N.	..	Representative of the Indian Navy.
Shri H. C. Raut.	..	Representative of the Hindustan Shipyard (Private) Ltd., Visakhapatnam.
Shri P. N. Rabady.	..	Representative of the Eastern and Western Shipping Corporations, Bombay.
Shri T. M. Sanghavi.	..	Representative of the Indian National Steamship Owners' Association, Bombay.
Shri F. V. Badami.		Development Officer, Development Wing, Ministry of Commerce and Industry, New Delhi.
Shri H. M. Trivedi.	..	Scindia Steam Navigation Company Limited, Bombay.*
Shri P. R. Subramanian.		Deputy Director-General of Shipping, Bombay.*

The Committee was given authority to appoint or associate with its work suitable advisers to advise it in the course of its investigations and report.

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*Members Secretaries.

1.2.1. **Terms of reference.**—The terms of reference of the Committee are:

1.2.2. To enquire into and report on the existing ship repair facilities in Calcutta, Bombay, Madras, Visakhapatnam, Cochin, Kandla and at such other places where, in the opinion of the Committee, the problem needs looking into.

1.2.3. To recommend what improvement and expansion is required in such facilities in order to meet adequately the requirements of the developing merchant shipping of India as well as of non-Indian shipping which may require repairing facilities at Indian ports;

1.2.4. To report particularly whether facilities for dry docking available at present are adequate and, if not, what improvements/additional facilities are required and at which places;

1.2.5. To report whether materials, stores, etc., required for ship repairing are available adequately within the country or whether the country is deficient in this respect. If the latter is the case, to recommend what steps should be taken for reaching self-sufficiency in this field as far as possible;

1.2.6. To consider and recommend the steps which are to be taken:

(a) by Government, and

(b) by the private sector

for securing such improvement and/or expansion in the ship repairing facilities as the Committee may recommend.

1.3. Shri Alagesan took charge as Chairman of the Committee in March 1958, and the members and secretaries were all part-time. With the approval of the Government, the headquarters of the Committee was fixed at Madras and the arrangements for setting up the office of the Committee at Madras, were completed in May, 1958.

1.4. We commenced our work with a preliminary meeting at Bombay on 16th April, 1958 when we considered the scope of our terms of reference and our programme of work. At this meeting it was decided to make certain assumptions with regard to our terms of reference, to which we shall refer in Chapter II; subject to this it was decided that no further clarification need be obtained from the Government regarding the terms of reference.

1.5. **Procedure**—We also decided at this meeting the procedure for eliciting opinions of various interests concerned on the subject. It was agreed that questionnaires should be issued to the Indian National Steamship Owners' Association and to individual Indian shipping companies, agents of foreign shipping lines at Indian ports, ship repairing firms and major port authorities. It was also decided that suitable questionnaires on specific points should be addressed to the maritime State Governments with regard to minor ports and also to the Principal Officer of the Mercantile Marine Department, the surveyors accredited to major Classification Societies stationed in India, the Indian Naval Dockyard and ship chandlers. It was also decided to obtain information through Indian consular authorities regarding the facilities available at selected ports in foreign countries.

Copies of the questionnaires issued by us to the various authorities etc., are appended as Annexure I. A list of the parties who replied to them is given as Annexure II.

1.6. **Advisers.**—Although we had authority to appoint suitable advisers, it was decided at the first meeting that it was not necessary at that stage to consider co-opting any persons as advisers or members. We later decided to associate the Principal Officers of the Mercantile Marine Department at Madras, Calcutta and Bombay with our work at their respective ports. Apart from this no other persons were appointed under the authority given to us.

1.7. **Tours.**—During the months of July to December, 1958, we visited the ports of Madras, Cochin, Calcutta, Bombay, Kandla and Visakhapatnam for on-the-spot studies and for receiving oral evidence. Sub-committees of our Committee also visited Tuticorin, Bhavangar, Bedi Bunder, Okha, Verawal and Mandapam for the same purpose. At all the ports visited by us we met the administrative authorities of the ports, representatives or agents of Indian shipping companies, agents of foreign shipping lines, officers of the Mercantile Marine Department, Port Officers, surveyors of major Classification Societies and suppliers of ship stores. We visited all the principal ship repair workshops in Calcutta, Madras, Cochin and Bombay as well as the Hindustan Shipyard at Visakhapatnam and had discussions with their representatives. We also visited the workshops of the port authorities at all ports. A list of the workshops which we visited is given in Annexure III. At Calcutta and Bombay we had discussions with the Collectors of Customs. We met the representatives of the INSOA, representatives of owners and repairers of inland water transport, Calcutta, the Iron and Steel Controller, Calcutta, the Deputy Iron and Steel Controller, Bombay and representatives of the Chipping and Painting Contractors' Association, Bombay. We also met Mr. Posthuma, Visiting Adviser to the Ministry of Transport on Development of Ports. A list of persons who gave oral evidence before us is appended as Annexure IV.

1.8. We met in New Delhi from the 25th to the 30th April, 1959 and in Bombay from the 3rd to the 20th May 1959 when the draft report was finalised and adopted by the Committee.

1.9. **Acknowledgements.**—We wish to record our appreciation of the co-operation and valuable assistance received by us from the various Governmental and port authorities, the INSOA and the representatives of Indian and foreign shipping lines, ship repairing firms, surveyors and others whom we met. Many of these authorities have also furnished valuable information in their written evidence. We would specially like to record our thanks to the Secretaries, Shri H. M. Trivedi and Shri P. R. Subramanian, who brought to bear their rich experience and intimate knowledge of the subject on the work of the Committee, the former by his long association with Messrs. Scindia Steam Navigation Company Ltd., India's leading shipping concern and the latter with the Directorate General of Shipping. We also wish to record our thanks to the office staff for their assistance and painstaking work.

CHAPTER II

TERMS OF REFERENCE

2.1. Before proceeding to the subject matter of our report we shall briefly refer to certain points which arise from the Government Resolution of 22nd January, 1958, and the terms of reference contained therein.

2.2. One of the basic assumptions which we have made with respect to our terms of reference is that our enquiry is to be confined to requirements of repairs to deep-sea merchant ships only. Although during our enquiries we discussed with certain authorities questions regarding the facilities available for building of seagoing, inland and sailing vessels as well as requirements of repairs to inland, fishing and sailing vessels, we do not propose to deal with these questions in our report.

2.3. For similar reasons we have not dealt at length with facilities provided in the Indian Naval Dockyard and the various port workshops. We visited these workshops and discussed the plans for their expansion. At present these workshops do not provide much assistance to merchant ships except in emergencies. They are also not likely to do so on a large scale in the near future. With a view to broadening the base of available repair facilities, we have, however, made recommendations as to the extent to which their assistance will be needed by merchant ships and which they should endeavour to provide.

2.4. The preamble to the Resolution states that the growth of Indian shipping during recent years has brought to light the need for a proper plan for the expansion of the ship repair facilities in this country to ensure the efficient and economical maintenance of ships and their repair. As an essential preliminary to the formation of such a plan, the Government have appointed our Committee to study and report on the existing ship repair facilities in the country with a view to effecting such improvements or expansion as may be called for having regard to the country's future requirements. Owing to various uncertain factors in the rapidly changing picture of today, like the rate of increase of Indian tonnage, the future level of demand for repair facilities for foreign ships visiting Indian ports, the development programmes of individual ports etc., we find it somewhat difficult to make recommendations on a long range basis. We shall therefore make our recommendations for improvement and expansion of repair facilities in two groups, namely those for immediate implementation during the remaining period of the current Five Year Plan and those for implementation in the Third Plan period. It is not possible to visualise the precise position of demand and supply of facilities beyond this period just now and the position may have to be reviewed at a convenient opportunity towards the close of the Third Plan period.

2.5. We have been asked to make recommendations regarding improvements and expansion of facilities in order to meet adequately the requirements of the developing merchant shipping of India as well as of non-Indian shipping which may require repair facilities at Indian ports. This implies that it will be necessary for us to assume at what level Indian tonnage will stand at different stages in future. But, in view of what we have stated in the previous paragraph, we can only base our estimate on the level of tonnage at the end of the Current Plan and of the Third Plan.

2.6. We understand that for the Current Plan the target of tonnage for Indian shipping is 9,00,000 gross and for our purposes, we have assumed that this figure will be reached. There is as yet no guidance available regarding the future as we understand that it is too soon to indicate an official target figure for the next Plan. The original target set by the Shipping Policy Sub-Committee in 1947, was a total of 2 million tons gross to be attained in a period of 7 years. Government then accepted this figure as the ultimate working target for Indian shipping but did not prescribe any definite date by which it was to be reached. As, however, the present tonnage is about 7 lakhs, we have assumed for our purposes that the target to be reached at the end of the Third Five Year Plan period will be 1·5 million tons gross which will be roughly double the present tonnage. Similarly, as regards foreign owned tonnage, we tried to collect some data regarding the continuance of the present quantum of work by certain lines and the possibility of some repair work being undertaken in Indian ports by others. We were however, able to get information of only limited usefulness on this subject from the agents concerned. It is also difficult for us to make any calculations on any rational basis regarding the likely future level of demand for repair facilities by foreign shipping companies. In the circumstances, we have decided to assume an *ad hoc* increase of 50 per cent in the present volume of work provided by foreign owned ships for the period which our report will cover.

2.7. Our terms of reference also require us to consider what facilities are required, besides the major ports, at such other places, where, in the opinion of the Committee, the problem needs looking into. We tried to deal with this by making an enquiry of the shipping agents concerned as to the minor ports where they carried our repairs to their ships during recent years and to what extent. We also tried to collect full information regarding the workshop, dry dock, slipway, repair berth, etc., facilities in the various minor ports. We shall deal with the information collected by us in a later chapter, but we may mention briefly here that the volume of repairs carried out in minor ports appears to be very limited. As, however, our enquiry is the first systematic study of this subject, we have appended the information collected by us regarding facilities available in the various minor ports in Annexures V (B) and VI. With a view to making facilities available on a broader basis than now, we have also made recommendations regarding improvements in some minor ports where the nucleus for carrying out repairs already exists.

2·8. The terms of reference relating to materials for repairs state that if it is found that the country is deficient in respect of any such materials, we should recommend the steps to be taken for reaching self-sufficiency in this field as far as possible. In this connection we also received extracts from a speech of the Hon'ble Minister for Transport and Communications in the Lok Sabha on 28th March, 1958, in which he stated that our Committee would be asked to examine the possibility of saving foreign exchange on equipment required for ship-building at the Hindustan Shipyard by considering the manufacture of such equipment in India. After considering this subject at our first meeting, it was felt that an investigation of this subject would entail a study, in respect of each of many thousands of parts which are required in connection with ship building, the present position regarding their manufacture in India, the likely future demand, the manufacturers who could undertake their immediate or progressive manufacture, the raw materials position regarding them etc. It was considered that this item was not strictly connected with our main terms of reference, which related to 'ship repairs', and that it would also not be possible for us to do justice to this subject within the short period during which we were expected to conclude our work. It was also brought to our notice that the Government of India had in the Ministry of Transport O.M. No. SY-8(5)/57, dated 11th November, 1957, set up a separate Standing Advisory Committee on Ancillary Industries related to ship building and ship repairs, to examine the question of progressive manufacture in India of equipment required for ship building and/or ship repairs which is now being imported. We accordingly reported to Government that, while we would deal with the urgent and short term issues in connection with our terms of reference, it would be more appropriate for the Committee on Ancillary Industries to consider the larger subject of progressive manufacture of the various items of equipment required for ship building and ship repairs. We shall, therefore, confine our remarks to the supply position in respect of such of the items as are at present manufactured in India and the difficulties in the way of importing other items which are not manufactured in this country.

2.9. Lastly, we would like to refer to the fact that one of our handicaps in making a precise study of this subject is the lack of reliable information on various points of importance. For instance, we could not get precise data from all shipping companies for the same periods in respect of expenditure on repairs to their ships under different heads in India and abroad, or information regarding periods of waiting for dry docks or repair berths for no fault of the ships or the shipping agents. Similarly, we tried to obtain information regarding comparative quotations for cost of repairs, in India and abroad, and also cases in which ships under repair suffered delay by not being able to get repair berths continuously. We shall refer to the information which we have received on these points but we may say atonce that it is neither as detailed nor as complete as we would like it to be. This is mainly because the authorities concerned have not considered it necessary to maintain such information for their purposes, but it would be of assistance in future if the port authorities and shipping companies keep certain essential information regarding dry dock, berths, time and expenditure on repairs etc.

CHAPTER III

Ship Repair Industry—General Considerations

3.1. The ship repair industry is as much a key industry as shipping and shipbuilding. In fact, no country which aims at having a large and efficient mercantile marine can afford to neglect either its shipbuilding or ship repair industry. Just as the shipbuilding industry is necessary for providing additions and replacements to the fleet, the ship repair industry is necessary for the efficient maintenance of the units of the fleet. It would be unwise for any country to rely on another country for the provision of repair facilities and, in times of emergency, such reliance may prove dangerous. Every maritime country should, therefore, have an efficient ship repair industry, with adequate capacity for the needs of her mercantile marine. The industry should have extra capacity for the requirements of foreign ships visiting the country's ports and also for emergencies.

3.2. The ship repair industry is of vital importance to a country from the foreign exchange point of view. In this matter, it is very similar to the shipping industry. To the extent its services are made available to foreign owned ships, the industry directly earns foreign exchange, and in so far as it provides services to national shipping, it saves expenditure which would otherwise have to be incurred in foreign currencies. Even in cases where it is necessary to import some essential repair materials, the industry can still earn or save foreign exchange of several times the value of such imports.

3.3. The ship repair industry can also be a useful adjunct to the general engineering industry. With its resources of plant and machinery, it can manufacture its own requirements of spares or miscellaneous stores, or can undertake general engineering work, like structural work, castings, etc., or develop independent lines of manufacture. Likewise, in respect of items for which there is demand in adequate quantities, the industry can support subsidiary industries dealing in those items. The existence of shipbuilding as a complementary activity provides added flexibility to the ship repair industry.

3.4. The industry has also an important place in the general economic picture. It provides employment for large numbers of labour and, by reason of the fact that its activities are diversified, it builds up and supports a skilled labour force for various categories of work.

3.5. It is of importance that a national ship repairing industry must be efficient and competitive in order to survive. Shipping in overseas trades is an industry subject to international competition and no country whose costs of construction, operation or maintenance are permanently higher than those of other countries can hope to run its shipping profitably on a long term basis in competition with the shipping of other countries. It is for this reason that some countries give subsidies or bounties to their shipping to offset the elements of higher national costs, which, besides other items, may include higher repair costs. The existence of such arrangements indicates the importance attached to the maintenance of an efficient shipbuilding and ship repair industry even in the face of the higher national costs involved.

3.6. It is equally true to say that an inefficient ship repair industry can act as a drag on the development of the national shipping industry. Ship repair costs form an important part of the total operational costs of a ship. An uneconomic ship repair industry can, therefore, adversely affect the competitive strength of national shipping as against shipping of other countries. Even in domestic trades where the competition may not be international, the existence of an uneconomic ship repair industry may ultimately result in higher charges and will weaken the position of domestic shipping as against other forms of transport.

3.7. Apart from the effects on shipping of an inefficient ship repair industry, the industry itself cannot survive as a permanent industry except on a competitive basis. It will be obvious that to any shipowner the prime considerations in arranging repairs are the time and cost of repairs. Where local repairs are likely to be more costly, he is apt to get competitive quotations from other ports or even other countries and, in this sense the competition is truly international. This is more so in the case of foreign shipping, whose owners have no special interest in arranging repairs in one country or another and to whom overall economy will be the ultimate consideration.

3.8. We shall discuss later the various factors which influence the time and cost of repairs. It is, however, necessary to emphasise that where factors exist which react adversely on the long term efficiency of the ship repair industry, the authorities concerned have as much responsibility in the national interests for remedying such adverse factors as the industry has for putting its own house in order in respect of matters within its control.

CHAPTER IV

Nature of Ship Repairs—Facilities required and their importance

4.1. Before proceeding to discuss the existing ship repair facilities at Indian ports, we feel that it would be of assistance if, apart from very specialized type of repairs, we deal in general terms with the type/nature of surveys or repairs which ships have to undergo, the facilities required therefor and the importance of such facilities. In addition to maintenance repairs which have to be carried out to the hull, machinery and equipment, a ship has to comply with statutory requirements under International Safety and Load Line Conventions and the rules of the Classification Societies (*e.g.* Lloyds' Register of Shipping) for purposes of safety, insurance etc. Many of these surveys involve extensive repairs and renewals.

4.2.1. In general terms surveys and repairs may be divided into the following categories:

Statutory requirements under International Conventions

4.2.2. **Passenger surveys.**—Passenger ships and passenger-*cum*-cargo ships carrying more than 12 passengers (or 30 unberthed passengers) have to undergo complete annual survey of hull, machinery, radio telegraph equipment and under water fittings under the supervision of the appropriate Government Department.

4.2.3. **Load Line Surveys.**—All seagoing ships of over 150 tons gross have to undergo these surveys once in five years, but the ships have to be examined annually for watertightness of all closing appliances, *e.g.*, hatches, storm valves, pipes, doors etc. and for checking of Plimsoll marks. These surveys are held under the supervision of Government surveyors or approved Classification Society surveyors on behalf of the Government.

4.2.4. **Safety equipment surveys.**—These surveys for cargo ships cover life saving appliances, light and sound signals, fire appliances etc. and the surveys are held once in two years under the supervision of Government Surveyors.

4.2.5. **Safety Radio Surveys.**—These surveys for cargo ships cover radio telegraphy or telephony and direction finding equipment and the surveys are held annually under the supervision of Government surveyors.

Classification Societies' Requirements

4.2.6. **Special surveys.**—These are surveys of hull and machinery and are carried out under the supervision of the Classification

Societies' surveyors every four years from the date of building of the ships. These surveys call for opening and overhauling of all important machinery and auxiliary equipment on board, testing the strength of various structural hull members including watertightness of tanks, compartments etc., and examination of anchor, cables etc. These surveys may, therefore, result in extensive repairs depending on the age of the ship concerned, both in dry dock and afloat.

4.2.7. **Dry dock surveys.**—These are held annually for examination of underwater fittings and plating.

4.2.8. **Tail shaft surveys.**—The tail shaft has to be drawn once in three years for inspection.

4.2.9. **Refrigeration and boiler surveys.**—These are arranged annually.

4.2.10. **Running surveys of ship's hull and machinery.**—These are continuous surveys to be completed in four years.

Other miscellaneous items

4.2.11. **Routine dry dockings.**—Some owners dry dock their vessels at intervals shorter than required under the rules for cleaning and painting of bottom for maintenance of speed and general efficiency of operation.

4.2.12. **Damage and emergency repairs.**—These are items which arise due to casualties such as grounding, collision, fire, sudden breakdown etc. and which cannot be anticipated. Sometimes the cost of such repairs can be very heavy and a part or the whole of such cost may be borne by the underwriters.

4.2.13. **Running or voyage repairs.**—These are maintenance repairs which are generally carried out afloat without interfering with the ship's schedules.

4.2.14. **Derrick tests.**—These are held once in four years, generally at the time of special surveys.

4.2.15. **Cargo gear, annealing and testing.**—These are held annually in accordance with Dock Safety Rules.

4.2.16. In order to minimise the time spent on repairs, the shipowner normally endeavours to combine as many of above surveys and repairs as possible which require immobilization of the ship.

4.3. **Facilities required for ship repairs.**—We shall now deal with the various facilities which are required for ship repairs under the following broad heads:—

Workshops.
Dry docks.
Repair berths.
Materials.
Labour.
Customs procedure.

4.4 **Workshops.**—It is an essential requirement for all types of ship repairs that there should be well organised workshops situated on the water front, preferably near the docks. These should be well equipped with modern machine tools and should have experienced supervisory staff and adequate skilled labour so that any kind of repairs to hull, machinery (whether steam, diesel, turbine or electric driven) and equipment can be carried out. The workshop should have a drawing office, fitting and erecting shop, machine shop, smithy, foundry, boiler and plater's shop, electrical shop, carpentary and joiner's shop, sail and rigging loft etc. Where repairs have to be carried out in stream, it is usual to have also some floating workshops which are well equipped with modern machine tools and adequate power supply. The workshops should also have a number of suitable transports in the form of lorries, trucks, launches and barges for carrying equipment and materials to and from the ships.

4.5. **Dry docks.**—A dry dock is an important and essential link in ship repairs. As indicated already, drydocking is necessary both in the interests of efficient operation of a ship as well as for compliance with the requirements of various surveys. A passenger ship has to be dry docked at least once a year and all ships have to be dry docked once in four years for special surveys and annually for periodic examination. Ships are also dry docked for bottom cleaning and painting for maintenance of speed. Chipping and painting of the hull, propeller work and examination or changing of the tail shaft or other under water fittings or under water damage surveys can be done only in the dry dock.

4.6. A dry dock is a necessity in all cases in which major surveys or under water repairs are to be carried out. Hence a port in which there is no dry dock can only provide facilities for running repairs and cannot normally develop or support a large ship repair industry. Similarly, the existence of good dry dock facilities can stimulate the development of other ship repair facilities and thereby promote the development of a ship repair industry.

4.7. **Importance of availability of dry docks.**—Even in ports in which there are dry docks, the availability of a dry dock, without delay, when the ship is ready to dry dock is of crucial importance. A ship engaged in the overseas trade visits its home port once in several months, and non-availability of a dry dock means unnecessary waiting which upsets her schedules. In the case of passenger ships such delays would be serious as their programmes are fixed well in advance. If a dry dock is not available when it is required, it may become necessary for the owner to dry dock the ship in another country thereby incurring foreign exchange expenditure. Similarly, when repairs are proposed to be arranged in a particular port for ships belonging to a foreign country, the non-availability of a dry dock may well result in the owner cancelling the arrangements and the repairer at that port losing the entire business. It is only in the case of ships in the coastal trade, which visit their home ports at shorter intervals, that some adjustment of the dry docking programme is possible, but even in their case repeated postponements of dry docking may result in increased maintenance and operation costs and also create complications with the ship's Classification Society and underwriters. Lastly, in view of the fact that a dry docking programme is generally arranged in conjunction with repairs afloat and in consultation with the repair workshops, Classification and Government surveyors etc., the non-availability of a dry dock, when required, may put the entire programme out of gear. Similarly, delay in dry docking or undocking of a ship may have reactions on the dry docking programmes of other ships waiting for dry docks.

4.8. **Importance of facilities at dry docks.**—Another important factor which affects the time taken for repairs in dry docks is the availability of necessary facilities at the dry docks. It is hardly necessary to stress that the time actually taken for repairs to a ship in a dry dock will be reduced if all necessary repair facilities are readily available. This is of particular importance in cases where (as in the case of most dry docks in Indian ports) the dry docks are situated away from the repairers' workshops, as it will obviously save the time involved in transporting to the dry dock necessary portable equipment such as welding sets, air compressors, generators, cranes, fire pumps, flood lights etc. Availability of these facilities at the site will make for economy in costs.

4.9.1. The important facilities which have to be permanently provided at the dry docks are as follows:

4.9.2. **Crane facilities.**—Cranes are required for the lifting or fitting of ship's parts which are taken to or from workshops. A heavy crane is required for removal of parts like shafts, propellers, rudders etc. Considering that the propeller of a modern ship can weigh 10 to 15 tons, the capacity of such a crane should be about 20/30 tons and it should be able to move alongside the dry docks and to plumb the farthest parts of the ship as required during repairs. It is not always convenient or feasible to depend on floating cranes for this purpose as considerable time will be lost if the crane is not readily available.

4.9.3. **Salt water supply.**—This is required both for the dry dock's own requirements as well as for testing tanks, fire fighting, refrigerating plant and other purposes.

4.9.4. **Fresh Water supply.**—This is required for the ships' personnel and shore labour and for boilers.

4.9.5. **Electric power supply at different voltages.**—Adequate supply of both A.C. and D.C. power at different voltages for the ship repairer and for the ship's lighting and power is required.

4.9.6. **Compressed air.**—Adequate supply of compressed air at required pressure is necessary for the repairer's pneumatic tools etc.

4.9.7. **Lighting system.**—To ensure economy in time taken for dry dock work and to enable the repairers to work round the clock it is necessary to provide flood lighting in the dry dock.

4.9.8. **Fire fighting appliances.**—There may be fires due to various causes when repairs are carried out and the arrangements for putting them out should be efficient as the ship's own fire fighting arrangements may be immobilized.

4.9.9. **Steam.**—The supply of steam at the dry dock will enable the ship to shut down its machinery and boilers for examination. Steam will also be necessary for running and testing steam driven auxiliary machinery, hoisting of anchors and cables etc. when the ship's boilers are not working. Steam can, in many cases, be replaced by compressed air if the latter is available in sufficient quantity and pressure.

4.9.10. **Facilities for lorries.**—Good approach roads and hard standing are necessary near the dry docks to enable lorries transporting materials to or from the workshops to come alongside.

4.9.11. **Sanitary facilities.**—These are necessary for the convenience of ship's staff and workmen.

4.9.12. **Telephones.**—These are necessary for quick communication between the ship and the shipping agents, ship repairers' workshops etc.

4.10.1. Another facility near the dry docks which also assists repair work is the following:—

4.10.2. Garbage bins are necessary for dumping waste material removed from the ship as the volume of such materials to be removed from ships under repair can be quite large.

4.11. It is easy to see that the lack of each of the above facilities can delay or hold up the repairs on a ship. The lack of several of these facilities together can result in a substantial loss of time. These facilities are provided in the normal course in all modern dry docks and they are regarded as the responsibility of the owners of the dry docks. It should be emphasised that the provision of these facilities not only helps in completing the work quickly and economically but also improves the efficiency of the dry dock itself resulting in better utilisation and improved earnings.

4.12. **Floating docks.**—In some ports floating docks are provided in addition to or in place of dry docks. Such docks can, however, be considered only in places where suitable conditions exist, and they are generally more expensive to maintain.

4.13. **Repair berths.**—Although in theory a ship should be able to carry out afloat repairs anywhere, in actual practice, except for very minor repairs, a repair berth is a necessity for carrying out repairs speedily. Without such berths it is impossible to immobilize the ship completely for continuous repairs. The complete immobilization of a ship and shutting down of her boilers will also enable work to be carried out on various parts of the ship simultaneously and for this purpose, it is necessary that a ship should have a safe berth in protected waters before major repairs can be undertaken. The repairs berth has in practice the same function as the fitting out berth in the case of ship building. The berth offers direct access to the ship from shore and provides the base on which the required materials may be assembled and from which power water, compressed air etc. lines can be taken to the ship for repair work. It is not necessary that the repair berth should cover the entire length of the ship as is desirable for cargo work and in fact a T-shaped jetty can accommodate several ships for repairs at a time and would be adequate from the utility point of view. Even so it is usual for most ports to provide conventional long berths for repairs, as the same berths are used for both cargo and repair purposes. Irrespective of the length of the berths, it is important that the ships should be able to come alongside and the berths should be fully equipped with necessary facilities. Light repairs can be carried out in stream with the help of floating workshops but the absence of crane and other facilities will make heavy repairs difficult or even impossible.

4.14. **Importance of availabiility of equipped berths for repairs.**—It is important for the efficient carrying out and speedy completion of repairs, that a berth fully equipped for repairs should be available as soon as the ship is ready for afloat work. The availability of such a berth will enable the necessary materials to be assembled and the work to be commenced without having to wait for portable units to be moved in. It will enable the repairer to concentrate on the work on several parts of the ship at the same time. Further it is important that the berth should be available continuously to the ship till the repairs are completed, as otherwise considerable time would be wasted in shifting the ship from berth to berth (or to stream and back to berth) and the maintenance of steam for the purpose will render it impossible to immobilize the ship completely. Time will also be lost in moving the portable equipment to the various berths where the ship is shifted, if these are not themselves fully equipped repair berths. As in the case of dry docks, the availability of facilities at the berths will assist in expediting the repairs and keeping the costs down and at the same time improve the utilisation of the repair berths themselves.

4.15.1. **Facilities required at repair berths.**—The facilities required at repair berths are mostly the same as those listed under dry docks and their provision is even more important than in the case of the latter, as afloat repairs usually take longer time. The variations or the additional permanent facilities required at the repair berths are listed below:—

4.15.2. **Cranes.**—Cranes of 5/10 tons capacity able to plumb the farthest part of the ship would be adequate in the case of repair berths.

4.15.3. **Oil bunkering.**—Oil bunkering facilities are necessary to save time in taking fuel after completion of repairs.

4 15.4. **Bollards.**—These are necessary for the safe mooring of the vessels during engine trials subsequent to major repairs.

Other facilities required within the dock area

4.16.1. **Sludge tanks/barges.**—These are necessary so that a vessel after cleaning her tanks can discharge the mixture of oil and water into these tanks/barges. Otherwise it will be necessary for the ship to transfer this sludge from one tank to another when each tank is cleaned for examination and finally for the ship to proceed to sea for discharging it and returning, if necessary, for examination before loading of the tank or tanks in which the sludge was last stored. This means surveys cannot be completed in one stage and will take more time.

4.16.2. A small space is necessary where repair firms can carry out limited machining etc.jobs and keep some of the essential portable equipment and spares and also maintain a small office.

4.16.3. Oil tanks barges are necessary so that fuel oil in the ship's tanks may be pumped into them while the vessel is under repair.

4.17. **Materials.**—It is important for efficient ship repair work that materials required for the repairs should be available without undue difficulty. Most of the repairers usually keep adequate stocks of a wide range of materials. Where any items of spares are not indigenously manufactured or are in short supply locally and also in the case of special items, they should be able to import them easily according to requirements. It is necessary to emphasise here that the non-availability of certain essential spares or materials or delay in obtaining them may result in the owner deciding to carry out the repairs in a foreign port.

4.18. **Labour.**—Ship repair work calls for a proportion of highly skilled labour for certain categories of work. The labour should be familiar with modern methods and practices which, with an advanced degree of mechanization, aim at completion of the work in as short a time as possible. At the same time, owing to fluctuating demands, the repairer has to maintain a proportion of the labour on a casual basis to keep his costs down. The quality and efficiency of the labour ultimately have a large bearing on the total time taken for repairs.

4.19. **Customs procedure.**—The customs procedure at the ports must be such as would permit quick transport of ships' parts from the ship which require workshop action and of the repaired parts or spares or other materials from the workshops to the ships. Similarly, the procedure must allow for speedy clearance of parts imported from abroad for ship repairs.

4.20. To sum up, the main requirement of an efficient ship repair industry is the availability, to the extent required and without delay, of the complex of workshop, dry dock and repair berth facilities. The ideal condition would be that these facilities are under unified ownership or control, as this would ensure their ready availability whenever required. This is the case in many foreign ports. Even where the facilities are controlled by different authorities, it is important that each of them is adequate to meet all demands.

CHAPTER V

SHIP REPAIR FACILITIES IN FOREIGN PORTS

5.1. We have mentioned in an earlier chapter that we made enquiries regarding the ship repair facilities available at certain selected foreign ports. Some of these ports were selected purely for comparison of the facilities in India with the standards in European and British ports and a few others like Karachi, Singapore and Hongkong were selected as they more or less compete with Indian ports for repair work. In all, our enquiries covered eight ports and the information received by us is summarised briefly in the succeeding paragraphs.

5.2. **Rotterdam (Holland).**—The port authorities own and hire out four floating docks which can take ships from 150′ to 550′ in length. These floating docks are equipped with various facilities like water, power, compressed air, etc., but they do not have cranes and the services of the port floating chanes are utilised when necessary. There are also some 20 privately owned dry docks ranging from 150′ to 700′ in length. All ships repairs are done by private companies which have several floating workshops (i.e. barges fitted with necessary equipment). The port does not provide repair berths but the repairing firms own several fitting out and repair berths which are well equipped.

5.3. **Antwerp. (Belgium).**—The port authorities own 10 dry docks of different sizes from 165′ to 740′ in length. Messrs. Mercantile Marine Engineering and Graving Docks Company, a private firm, owns four dry docks and has plans for building a fifth dry dock. Yet another dry dock is under construction for a private firm. The port provides two fully equipped repair berths for repairs to ships afloat. Besides these port berths, the Mercantile Marine Engineering and Graving Docks Company owns two wet docks and two others are under construction for two private repair firms. All the dry docks and repair berths are equipped with necessary facilities, including cranes.

5.4. **Falmouth (United Kingdom).**—The Falmouth Docks and Engineering Company, a private repair firm, owns four dry docks, ranging from 550′ to 850′ in length. It has also a floating dock 530′ in length. All these docks are equipped with all facilities and, in addition, the port has modern facilities for tank cleaning. There is also ample berth space available for ships needing repairs.

5.5. **Birkenhead (United Kingdom).**—Two private ship repair firms provide both dry docks and repair berths which are all fully equipped. Messrs. Grayson Rollo and Clover Docks Limited have four dry docks ranging from 250′ to 570′ in length and are constructing a new dry dock of 800′ length. Messrs. Cammell Laird and Co., Ltd., who also a large shipbuilding firm, own seven dry docks ranging from 300′ to 860′ in length. One of their existing dry docks is also being lengthened and deepened to take ships of about 850′ in length.

5.6. **Liverpool (United Kingdom).**—There are 14 dry docks ranging from 260′ to 1050′ in length which are all owned by the Merseyside Docks and Harbour Board. A working party appointed by the Admiralty and the Ministry of Transport in the U.K., in 1950 recommended that no additional dry docks were required but that there was a need for improved services and more travelling cranes. The first phase of the work has been completed and as an indication of the services which were considered necessary, it may be mentioned that the following facilities have been provided:—

Electric travelling cranes, with a capacity of 15 tons at 110′ maximum radius and 5 tons at 130′ maximum radius which will enable the centre and far side of a ship to be plumbed.

Compressed air supply of 2000 c. ft. per minute fed from 3 compressors at a working pressure of 100 lbs. per square inch.

Salt water main along the bottom of the docks, supply being 750 gallons per minute.

Electric supply at 460, 230 and 110 volts D.C. for supply to ships' busbars and 400 volts 3 phase A.C. for welding transformers and also A.C. to ships with a total of 70 connected points, the same being available for electric appliances and lighting.

Fresh water supply is already available in the dry docks.

The Mersey Docks and Harbour Board do not provide regular repair berths since Messrs. Cammell Laird and Company have in Birkenhead, which is on the opposite side of the River Mersey, several well equipped berths for long term ship repairs of all descriptions. However, the Mersey Docks and Harbour Board make available for ship repairs lay-up-berths when these are not required for the commercial use of the port.

5.7. **Hongkong.**—The ship repair industry is mainly centred on two large private establishments which also undertake new building work. The Hongkong and Whampoa Dock Company, Limited, owns five dry docks, the largest of which is 700′ in length. All the docks are served by cranes and well equipped workshops closeby. There are also three large slipways capable of accommodating vessels upto 240′ in length. The company also owns several ship building and repair berths.

The Taikoo Dockyard and Engineering Company Ltd., owns a dry dock which can take ships of 750′ in length. The company also owns four berths which are equipped with all facilities.

Both the firms are well equipped for carrying out repairs in stream and they also build and repair reciprocating, turbine and diesel machinery. Equipped as they are with their own dry docks, repair berths and workshops close to each other and with the added advantages of relatively cheaper and efficient labour and duty-free imports of materials they have lately been able to attract a great deal of ship repair work on foreign ships.

5.8. **Singapore.**—The Singapore Harbour Board owns and operates two dockyards, the larger being at Keppel Harbour and the smaller at Tanjong Pagar.

There are six graving docks in the dockyards, the largest of which can take ships of 45,000 tons gross. These docks range from 400' to 860' in length. All the dry docks are served by travelling cranes of upto 30 tons capacity. All labour required for repairs is provided by the Board.

Repair berths in the dockyards total 3,000' in length and conditions are such that vessels can be double banked at repair berths, if necessary. They are served by portal cranes of upto 25 tons capacity and a 80 ton floating crane is available for heavy lifts. No wharf dues are charged on vessels at repair berths. Water, power and other facilities are available at all dry docks and repair berths.

5.9. **Karachi (Pakistan).**—The Karachi Shipyard and Engineering Works which is managed by the Pakistan Industrial Development Corporation commenced functioning last year. Although it is primarily designed as a ship building yard, it also offers good facilities for ship repairs. The shipyard has a drydock which can take ships of 580' length, 75' beam and 26' draft at high tide and 16' at low tide. The dry dock was a 10 ton portal travelling crane. It is well served with electric power, water and other facilities. There is a 1550' long fitting out quay which is capable of accommodating 4 cargo ships of medium size. A 30 ton crane traverses the entire length of the quay and all along the edge of the quay outlets are provided at intervals for supply of electric power, both A.C. and D.C., at various voltages and for oxygen, acetylene, compressed air, and salt and fresh water. The shipyard has a modern and well equipped workshop attached to it.

5.10. Besides the ports mentioned above, it is well known that in other countries like Japan, West Germany and the Scandanavian countries, the shipbuilding yards also possess extensive ship repair facilities including well-equipped dry docks, workshops and repair berths.

5.11. It will be observed that in most of the ports the repair facilities are owned by private ship repair firms and that where such facilities are provided by public authorities, the dry docks etc., are equipped with all essential services. The feature of these private repair yards is that the dry docks, repair berths and workshops are all owned and controlled by the repair firms and adjoin each other. The favourable location and control over all the three units ensure the ready availability of any of these facilities when required. As the workshops are close-by, the need for transporting labour, machinery parts, stores etc., over long distances is avoided and customs difficulties are also obviated. A few of the ports mentioned above are free ports. This ensures the easy availability of spare parts and materials.

5.12. The main factor which contributes to speedy ship repairs in foreign ports is the complete immobilization of the ship under repair. From the time that the ship is taken in hand, especially for survey repairs, to the time it finishes repairs, the available facilities both at dry docks and alongside repair berths are such that simultaneous and continuous work on the hull, machinery, boilers, auxiliaries and equipment is possible. The familiar sight in foreign ports of a ship under repair is a totally dead ship, where the repairer opens up all parts requiring examination and repairs, taking them out and in, replacing and refitting, while a host of flexible pipes and cables are led into every part of the ship for power, compressed air or steam, water, draining out sludge, refilling oil or water etc., and the crane ashore is hoisting or lowering hull plates, cylinders, winches, hatch boards, mobile welding sets and compressors. It is the existence of these conditions that enables foreign ship repair yards to compete effectively on an international basis.

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CHAPTER VI

SHIP REPAIRS EXPENDITURE

Present position and future potential

6.1. We stated in Chapter I that we issued questionnaires to foreign shipping agents in Indian ports and to Indian shipping companies covering various points arising from our terms of reference. In this chapter we shall deal with the information furnished by them regarding the number of calls made by ships under their agency at Indian ports or the number of ships operated by them, the quantum of repair work arranged for them in Indian ports and the prospects for the future.

6.2. **Arrangements of Indian and foreign shipowners for repairs.**—It appears from the replies received that, except for minor running repairs and occasional damage repairs, all major repairs and annual or periodic surveys of Indian ships, either coastal or foreign going, are carried out at Calcutta or Bombay. Indian ships engaged in foreign liner trades, however, carry out repairs which at times are considerable at foreign ports, mainly in the United Kingdom and the Continent. Indian ships engaged in foreign tramp trades also carry out some repairs at foreign ports like Hongkong and ports in Japan. Foreign tramps carry out only the minimum running or urgent emergency repairs at Indian ports. Foreign ships in liner trades, except those of the British India Steam Navigation and associated companies, Asiatic Steam Navigation Co., and Mogul Line, confine repairs carried out at Indian ports to the minimum. Generally speaking, neither foreign tramps nor liners carry out annual or periodic surveys in India. Repairs to Indian owned tankers are generally carried out in India. Foreign tankers calling at Indian ports, except those under the agency of Burmah-Shell, carry out only essential repairs in India in cases of urgency or emergency.

6.3. **Foreign shipping agents.**—We have received replies from the agents of foreign shipping companies indicated in Annexure II but they are not complete. We also had some discussions with the agents subsequently when we visited the various ports. According to the information which we received from them, the ships of the various liner agents who replied call at different Indian ports annually are as follows:—

Calcutta	557 calls
Visakhapatnam	289 „
Madras	440 „
Cochin	308 „
Bombay	846 „
Ports not specified and minor ports	281 „
Total	2,671 „

As stated above, the information is not complete and this appears to be so particularly in respect of Calcutta. These figures do not include particulars of calls of tramps and other occasional vessels.

6.4. The actual expenditure incurred by the principal companies on repairs to these ships in Indian ports during the last three years was as follows:—

	1955	1956	1957
1. B.I.S.N. Ltd.	1,17,36,100	1,12,76,100	1,45,82,500
2. Asiatic & Mogul Line	16,73,000	53,42,000	60,96,000
3. B. P. Ltd.	7,89,500	25,08,500	34,51,100
4. Mackinnon, Mackenzie—Other Agencies	7,21,500	7,41,200	26,98,600
5. Shell Tankers	..	27,91,000	1,91,200
6. Burmah Shell	7,50,400	9,63,900	11,88,200
7. Volkart Bros	10,54,300	3,99,400	12,86,700
8. Brockel Banks	5,47,000	6,76,100	6,86,100
9. Caltex Ltd.	3,66,200	1,40,200	8,37,400

6.5. We asked for an indication from the foreign shipping agents regarding the prospects of an increase in the number of calls of the ships under their agency but none was able to give any definite replies. With regard to the prospect of increased ship repairs being carried out in India, they said that this depended mainly on the policy of their principals, but they felt that if good facilities existed in India for carrying out repairs quickly and at reasonable cost, the owners might be willing to carry out part of their repairs in India.

6.6. Our attention was particularly drawn to the fact that with the establishment of two oil refineries at Bombay and one at Visakhapatnam and the consequent import of crude oil to the tune of 3 million tons annually, the calls of tankers at these ports have been increasing. Moreover, the refined products have to be distributed to various ports on the Indian coast and the excess refined products exported. It was mentioned to us that some repairs to tankers were carried out in Bombay, but in most cases these were undertaken in foreign ports. The Caltex Refinery at Visakhapatnam mentioned that most of their tankers were repaired at Hongkong or Japanese ports. One of the agents mentioned that facilities for gas-freing of tanks, repairs to corrugated bulkheads, dry docking of T.2. type tankers and other large size tankers which normally bring crude oil, were inadequate.

6.7. The question of speed in repairs is of particular importance in the case of tankers, as the tankers, which are usually on time character to oil companies, go off hire for the periods during which they undergo surveys or repairs. Furthermore, tankers, whilst trading, stay in ports for very short periods and hence no running repairs can be carried out except when they are immobilized. It is, therefore, necessary that when a tanker is ready for dry docking, survey or repairs, all facilities should be available without delay. Lack of these facilities at Indian ports is the main reason why tanker repairs are carried out at foreign ports, though this involves ballast runs from the last port of discharge to the port at which repairs are carried out. It was suggested to us that if comparable facilities are developed in Indian ports the owners would be willing to make use of them.

6.8. **Indian shipping companies.**—A statement showing the names of Indian shipping companies and the particulars of their fleets, as on 31st March 1959, is appended as Annexure VIII. It will be seen that the present Indian merchant fleet consists of 141 units of a total gross tonnage of 6,46,706. The figures of annual expenditure on repairs in Indian ports and foreign ports furnished by the seven principal companies for the last three years are as follows:—

Names of owners	Indian ports Rs.	Foreign ports Rs.
1. *Eastern Shipping Corporation*		
1955-56	10,56,800	..
1956-57	22,39,200	
1957-58	not furnished	
2. *Scindia Steam Navigation Co.*		
1954-55	62,39,100	8,81,000
1955-56	78,49,600	14,12,400
1956-57	98,88,700	19,52,500
3. *India Steamship Company*		
1954-55	9,50,000	14,20,000
1955-56	6,10,000	24,30,000
1956-57	10,80,000	19,50,000
4. *The Great Eastern Shipping Co.*		
1955-56	12,07,000	4,39,500
1956-57	10,64,200	26,56,800
1957-58	5,76,490	8,44,400
5 *The Bharat Line*		
1955	25,93,600	26,800
1956	23,28,900	38,700
1957	12,44,600	20,08,100
6. *Malabar Steam Ship Company*		
1955-56	3,00,000	Nil
1956-57	8,00,000	
1957-58	20,00,000	
7. *Bombay Steam Navigation Co.*		
1954-55	11,63,800	Nil
1955-56	10,47,300	
1956-57	10,94,700	

6.9. Previously there was no control over repairs to Indian ships in foreign ports, but since August, 1958 the Directorate General of Shipping has to be approached for approval in all cases where repairs are to be carried out abroad. We heard some criticism from some ship repairers that Indian companies were undertaking considerable repairs and dry docking work abroad and that this was unjustifiable in the existing critical foreign exchange position. On the other hand, the Indian National Steamship Owners' Association represented to us that the arrangements for repairs to ships engaged in overseas trades had to be made well in advance and that Indian owners were compelled to arrange for some repairs abroad because facilities were not always readily available in India, with the result that considerable

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delay and detention were involved, whereas easy facilities were available in foreign ports, not only in respect of repair berths and dry docks but also in respect of spares, materials etc. They mentioned that surveys were usually completed in about half the time taken in India and that it was obviously of advantage even from the foreign exchange angle, if the ships returned to service earlier, as they also started earning freight earlier. They accordingly requested that the existing restrictions on arranging repairs abroad should be lifted.

6.10. To summarise the matters dealt with in this chapter, Indian shipping companies incur an expenditure of approximately Rs. 2¼ crores per year on repairs and, on the basis of the assumptions made by us, this may be expected to double itself in due course. There is, however, a tendency to arrange part of the repairs etc., in foreign ports owing to lack of favourable conditions in Indian ports. So far as foreign lines are concerned, the present turn over of repairs is of the order of Rs. 2½ to 3 crores. Assuming that it will increase by about 50 per cent., the total turn over of the industry can be expected to reach about Rs. 10 to 15 crores annually. The possibility of attracting more work from foreign lines, however, depends on the provision of better over-all repair facilities in Indian ports so as to enable the industry in India to make competitive quotations.

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CHAPTER VII

SHIP REPAIR WORKSHOPS—CAPACITY AND TURNOVER

7.1. The ship repair facilities in India are concentrated, both in number and capacity at the big terminal ports for trade, namely Bombay and Calcutta. This is obviously a development based on the development of the country's trade and the number of both Indian and foreign vessels calling at these ports. The number of vessels calling at Calcutta or Bombay in any year exceeds by far the number calling at the other four major ports. The bulk of the capacity of the industry as a whole is, therefore, concentrated at Calcutta and Bombay. Although precise information is not available, it appears that ship repair yards have been in existence in both these ports for nearly two centuries. The first dry dock seems to have been built in 1750 in Bombay and in 1781 in Calcutta. The present Scindia Workshop in Bombay was originally started in 1908 and the Mazagon Dock in Bombay in 1915 and the Garden Reach Workshop in Calcutta in 1916. The other principal workshops have also been in existence for over 30 years. We shall now consider the capacity and turnover of the main repair workshops at the major ports in India.

CALCUTTA

7.2. **Garden Reach Workshops.**—This is the largest ship repair yard in Calcutta. It is owned and controlled by the B.I. Group. The turnover of Garden Reach Workshops on account of ship repairs only for the last three years was as follows:—

	Rs. in lakhs
1955	133·89
1956	191·96
1957	215·00

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It can carry out 40|50 special surveys and running repairs to about 500 vessels every year. It employs about 3,000 workers and can employ more men, if there is work. Besides ship repair work, it also undertakes a considerable amount of new construction and general engineering work. The general engineering work includes manufacture of Johnston pumps under licence, mine haulage gear, structural engineering work, manufacture of tram car frames, castings, buildings of army pontoons etc. As a matter of policy, the management has lately diverted repair work on inland vessels to the India General Navigation and Railway Company Workshops (which is also controlled by the same group) with the result that the volume of this work available to Garden Reach is now very much reduced.

7.3. **Hooghly Docking and Engineering Company.**—This is a well established workshop managed by Martin Burn Ltd. The turnover of the Company on ship repairs was as follows:—

	Rs. in lakhs
1955	28·63
1956	81·77
1957	37·00

The company has a fairly large workshop employing about 1,200 workmen. During recent years, some new machines have been installed, as the company had contracts for building machinery and boilers for large inland vessels. The workshop is equipped for building of small vessels and aluminium alloy life boats. The company has a small machine shop near King George's dry docks in which it can carry out small items of machining. It can handle about 10 to 15 surveys and running repairs to 180 to 200 ships a year. At present it works only one shift due to insufficient work. It also undertakes other general engineering work and can handle more ship repair work.

7.4. **Shalimar Works.**—This workshop is managed by Turner Morrison and Co., and was originally established to cater for the needs of the fleet of the Asiatic Steam Navigation Company, whose vessels previously operated on the coast. Its total turnover was as follows:—

	Rs. in lakhs
1955	48·00
1956	78·00
1957	149·00

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This workshop can handle four ships under survey and running repairs to 20 to 30 ships at a time. The workshop is adequately equipped for its requirements, but a good part of the machinery is old. It employs about 800 men and has a small godown in the port area. It has inadequate work and works only one shift. It undertakes other general engineering work, when available.

7.5. **Ship Repairers (Private) Ltd.**—This is a subsidiary of the Bharat Line and was established in August 1956 mainly to look after the repair requirements of the Company. The turnover of the company during 1957 was Rs. 6·45 lakhs and it is expected to increase in future. The workshop can handle one ship under special survey, four ships under annual surveys and several ships for running repairs at a time. It has a labour complement of 75 persons and works two shifts.

7.6. **Ching Wah and Co.**—This is a small workshop in the city area with a labour complement of 20 permanent men in the workshop, but employs about 300 casual workers for running repairs. It undertakes sub-contract work, but does not handle hull work. Its turnover in 1955-56 was Rs. 18 lakhs and in 1956-57 Rs. 24.26 lakhs.

7.7. **India Marine Service (Private) Ltd. and Calcutta Docking and Engineering Co.**—Both these workshops undertake repair work, mostly running repairs, on ocean going merchant vessels.

7.8. **Repairs to inland vessels.**—It is also worth noting that running repairs and periodic surveys of a fleet exceeding 300 vessels of all sizes ranging from large inland steam and motor vessels to barges and flats of varying deadweights are carried out at Calcutta every year. The more important of the workshops engaged on such work are—

India General Navigation and Railway

Port Engineering

East Bengal Engineering and

People's Engineering.

The total turnover of these workshops is fairly large and is of the order of Rs. 130|150 lakhs every year, of which approximately two-thirds is accounted for by India General Navigation and Railway Co.

BOMBAY

7.9. **Mazagon Dock.**—The Mazagon Dock, owned and controlled by the P. & O./B.I. (Penninsular and Oriental and British India Steam Navigation Company) group, is the largest ship repair yard in Bombay. Its turnover on account of ship repairs for the last three years was as follows:—

	Rs.
1955	264:04 lakhs.
1956	238·67 lakhs.
1957	267·04 lakhs.

The Mazagon Dock builds small ships and craft and can undertake manufacture of certain types of spares and equipment, if there is demand. It employs about 3,000 workers and can increase the number, if necessary. It can carry out 40/50 special surveys and running repairs to about 500/600 vessels every year with the present labour capacity. It also builds Campbell Engines under licence and undertakes other general engineering work.

7.10. **Scindia Workshop.**—The Scindia Workshop is a subsidiary of the Scindia Steam Navigation Company and primarily (to the extent of 85 per cent. of its capacity) deals with repairs to the company's vessels and also the vessels of its associated company the Bombay Steam Navigation Company. The turnover of this worshop during the last three years was as follows:—

	Rs.
1955-56	71:02 lakhs.
1956-57	82·51 lakhs.
1957-58	96·94 lakhs.

The workshop is well equipped and has recently been modernised. It can handle 20 to 25 surveys and running repairs to about 260/280 ships per year. It employs a pool of about 1500 workers and generally works two shifts. It also undertakes other general engineering work and can handle more ship repair work.

7.11. **Alcock, Ashdown and Company.**—This workshop is managed by Turner Morrison and Co. Its turnover was as follows:—

	Rs.
1955	38·85 lakhs.
1956	27·49 lakhs.
1957	34·74 lakhs.

The workshop can handle about 15 ships for surveys and 400 ships for afloat repairs per year. It employs about 1,000 workers and works two shifts. Its present turnover to the extent of 40 per cent. is accounted for by ship repair work and the balance by general and structural engineering work. It can handle more ship repair work.

7.12. **Modern Mechanical and Marine Works.**—This workshop does work on behalf of Mazagon Dock, Scindia Workshop and some Indian shipping companies. Its turnover was as follows:—

	Rs.
1955	5·80 lakhs.
1956	7·78 lakhs.
1957	10.08 lakhs.

It is a small workshop employing about 50 men on permanent basis and casual labour as and when required. It works two shifts.

OTHER MAJOR PORTS

7.13. The stay of vessels in port at the other major ports of Visakhapatnam, Madras, Cochin and Kandla is generally too short for them to undergo any considerable repairs. Owing also to the non-existence of dry docks, the development of the ship repair industry in these ports is very limited. In fact there are no established repair firms in Visakhapatnam and Kandla at all. At Visakhapatnam the Hindustan Shipyard used to do some repair work in the immediate post-war years, but it now concentrates on ship building and does not normally undertake ship repair work. At Kandla, the Malabar Steamship have shown interest in establishing a repair workshop.

MADRAS

7.14.1. There are two ship repair firms in Madras, particulars of whose capacity etc., are given below:—

7.14.2. **Binny's Engineering works.**—This is a well established workshop, which was previously located within the port limits. Owing to the requirements of space in the harbour area due to the port development plans, Binnys have been required to vacate most of the space occupied by them; except for a small workshop in the harbour. They have accordingly shifted to Meenambakkam, which is 16 miles away from the port, where they have laid out the workshops on modern lines. Their turnover on ship repairs was as follows:—

	Rs.	
1955	4·10	lakhs.
1956	2·48	lakhs.
1957	3·09	lakhs.

They can handle 200/250 ships for running repairs per year. Due to limited volume of ship repair work, which is about 5 per cent. of their total turnover, they have developed facilities for assembling of railway wagons, which appears to be their main activity now. They also undertake general engineering work.

7.14.3. **Harbour Engineering Company.**—This is a small workshop with an average turnover of Rs. 2·7 lakhs per year.

COCHIN

7.15. **Brunton & Co. Engineers.**—This is the only established ship repair firm in this port. It has a workshop employing about 300 men and has a fairly large machine shop, which needs to be modernized. Its turnover has fallen to about Rs. 80,000 although it used to be about Rs. 2½ to 3 lakhs in the past. It has a boat building and repairing yard in Vypeen and, owing to the decrease of ship repair work, it has developed some subsidiary activities like manufacture of aluminium water tanks for railways etc.

7.16. **War time control.**—From the point of view of quantum of business, the best period for the ship repair industry in recent times was probably the World War II and immediate post-war years. During the war, the volume of repair work which had to be done was so large that orders were issued that only minimum repairs necessary to keep vessels in service need be carried out. In order to make the best use of the available materials and facilities an organisation called the Directorate General of Shipbuilding and Repairs was set up to license and control all repairs in Indian ports and to allot appropriate priorities to different jobs. The facilities of all the workshops were pressed to the fullest possible use, and, besides repairs, the workshops handled numerous major jobs of construction of hull, machinery and equipment, conversion, refitting, defensive equipment for merchant ships etc. In the post-war years, the volume of deferred repairs and the refitting of merchant ships returned from naval service provided adequate work to keep the repair yards busy. This work, however, subsequently tapered off and the industry is now, dependent only on whatever work it can normally secure by competition. The nature and volume of work actually carried out during the last war is an index both of the capacity of the industry and of the vital needs it serves in times of emergency.

7.17. We do not consider it necessary to analyse in detail the equipment etc. of the various workshops. But the particulars supplied to us regarding them are all summarised in Annexures V (C) and V (D). We have also not referred to a number of small firms which handle ship repairs, either as sub-contractors or doing specialised jobs such as electronics, refrigeration, insulation etc., but we append a list of such firms in Annexure VII. The port authorities at all major ports also have fairly well equipped workshops with dry dock or slipway facilities. In this chapter we have only dealt with the capacity, turnover and potential of the important private ship repair workshops. We propose to deal with the dry dock and repair berth facilities available at the major ports, both with these workshops and the port authorities, in the next chapter.

7.18.1. The deep sea ship repair industry is thus a well organised industry, which is entirely in the private sector, and the repair firms have very long experience behind them, besides being equipped with a trained labour force of the order of 12000/15000 men and fairly good machinery. As it is, the industry is mainly based on Calcutta and Bombay and can handle approximately 75/100 surveys and about 750/1000 ships for running repairs at each of these ports. It has a turnover of Rs. 4 to 5 crores at each of these ports, of which three units in Calcutta, namely Garden Reach, Hoogly Docking and Shalimar, account for over 90 per cent. Similarly in Bombay, three workshops, namely, Mazagon Dock, Scindia Workshop and Alcock Ashdown together account for over 90 per cent. of the turnover at that port.

7.18.2. The two largest ship repair workshops in India are the Garden Reach Workshops in Calcutta and the Mazagon Dock in Bombay. Both these are owned and controlled by the P. & O./B.I. Group and were originally established mainly for the requirements of their fleets, although they have catered for the needs of other lines as well. The P. & O. and B.I. are still feeding these workshops with a proportion of their work, but with the reduction in their fleets based on India and due to other reasons, the volume of repair work of these fleets has declined during recent years. Shalimar and Alcock Ashdown, which are controlled by Turner Morrison and Co., were similarly established and catered mainly for the vessels of the Asiatic Steam Navigation Company and the Mogul Line. Partly owing to the same reasons as in the case of P. & O. and B.I. the volume of work on these fleets has also gone down. Hoogly Docking is controlled by Martin Burn and used to cater for a group of foreign owned shipping companies. Hooghly Docking also complained of a progressive reduction of ship repair work. To meet the needs of the expanding fleet of their principals, the Scindia Workshop has carried out modernisation and some additions in the last few years, and unlike other units in the industry, has plans for further improvement and expansion of its capacity.

7.19. In terms of capacity, the major workshops, both at Calcutta and at Bombay, are equipped with facilities for a wide range of work including foundries for heavy and light castings, machine shops with a wide variety of machines capable of dealing with shafting work, heavy turning, boring, shaping and planing work, in addition to production engineering of light types, boiler shops with facilities for fabrication of sections and well equipped carpentry and joiners' shops. The capacity of the industry both at Calcutta and Bombay is large enough to take care of major surveys and running repairs to Indian ships with ample margin for all such surveys and repairs as may be required by foreign owned ships calling at these ports. Except for Scindia Workshop, the volume of ship repair work of the major workshops has lately shown signs of reduction. The industry in Madras and Cochin has good possibilities of development for limited types of repairs, but here also the volume of work has gone down recently and most of the workshops have had to take to some subsidiary activity to provide work and employment for their plant and labour.

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CHAPTER VIII

DRY DOCKS AND REPAIRS BERTHS AT MAJOR PORTS

8.1. We have summarised the information regarding the existing dry dock, slipway and repair berth facilities in various ports furnished to us in Annexure VI, but we shall refer to the important features here for the purpose of directing attention to the problems facing the industry. We shall first refer to the facilities available with the private sector and then those provided by the port and other authorities.

FACILITIES IN THE PRIVATE SECTOR

CALCUTTA

8.2.1. There are two dry docks in Garden Reach Workshop 464' and 326' long respectively, which can take vessels of approximately 9′ 6″ draft. Hooghly Docking has a dry dock 300′ long which can take vessels of 15′ draft. India General Navigation and Railway has three dry docks, which can take vessels of 8′ to 11′ draft. All these dry docks are not capable of taking deep sea ships of over 1200 G.R.T. They are suitable only for inland and small coastal vessels. In the case of the dry dock of Hooghly Docking, there is the added disadvantage that it is situated above the Howrah Bridge and there is not sufficient clearance for vessels to pass under the bridge.

8.2.2. As regards slipways etc., Garden Reach has five patent slipways and one small covered slipway. Hooghly Docking has four building berths, Shalimar has three slipways, Port Engineering has a total of ten slipways and People's Engineering has one slipway. India General Navigation and Railway has two slipways, each with a cradle 255′ long. All these slipways are however suitable only for the use of inland vessels.

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8.2.3. There are no repair berths available with the ship repair firms engaged in repairs to deep-sea ships. Consequently, these firms have to rely entirely on the port's facilities for their requirements of dry docks and repair berths.

BOMBAY

8.3.1. The Mazagon Dock controls three dry docks of which the Ritchie drydock is 495′ long and can take ships of 18′ draft and the Mogul dry dock is 426′ long and is capable of taking ships upto 16″ draft. The Ritchie dry dock could be lengthened and deepened, if necessary. The third dry dock is smaller (154′ long) and is not suitable for deep-sea ships. Although the Ritchie and Mogul dry docks are fairly well equipped, the approach channel to them has silted up during recent years and docking and undocking of ships have to be done on high spring tides, even if the ships are ready earlier. The Mazagon Dock endeavours to redge the mouth of the dry docks with its own small dredger, but the dredging of the approach channel is beyond its capacity. Another factor is that other repair firms are not allowed to work in these dry docks. As a result, these dry docks have not been fully employed. According to figures furnished by Mazagon Dock, the percentage utilisation of these dry docks for the last three years was as follows:—

Year	Percentage utilisation	
	Ritchie dry dock	Mogul dry dock
1956	59·48	18·80
1957	58·10	23·17
1958	57·35	18·28

8.3.2. There are no other privately owned dry docks suitable for large deep-sea ships in Bombay. The Scindia Workshop has a patent slipway with a cradle of 255′ length, which is used for dry docking coastal vessels upto 1200 G.R.T., but the approach channel to this slipway is the same as that the Ritchie dry dock and, owing to siltation there is considerable difficulty in making full use of the slipway.

8.3.3. There are no repair berths owned by the private firms. The Bombay Port Trust, however, owns a tidel basin known as the Kassara Basin abutting the Mazagon Dock and close to Scindia Workshop and Alcock Ashdown, which is being used for ship repair purposes. Owing to the siltation of the channel and the basin, ships, have to enter at high tide and have to sit on the mud in the basin in low water, which restrict the use of the basin.

8.3.4. To sum up, except for the limited facilites of the Ritchie and Mogul dry docks and the Kassara Basin, the ship repairers in Bombay have to depend entirely on the facilities provided by the Port Trust dry docks and berths.

OTHER MAJOR PORTS

8.4. There are no dry docks or repair berths controlled by the private ship repair firms at the ports of Visakhapatnam, Madras, Cochin and Kandla.

8.5. None of the private ship repair firms at the major ports, including Calcutta and Bombay, has any definite plans for construction, improvement or expansion of dry docks or repair berths.

FACILITIES PROVIDED BY THE PORT AUTHORITIES

CALCUTTA

8.6. **Dry docks.**—There are five dry docks in Calcutta controlled by the Calcutta Port Commissioners. Two of these are in King George's Dock and can take ships of up to 550′ length. The remaining three are in Kidderpore Dock and can take ships of 520′, 470′ and

335′ length respectively. The King George's is dry docks can accomodate two ships in tandem with a caisson in between them, but, as the entrance is only from one end, the ship in the inner dry dock has to wait, even if her work is completed, until the ship in the outer dry dock is undocked. This is a disadvantage and militates against the utilisation of the dry docks to the maximum extent. Allotment of the dry docks is made by the port authorities on applications received from shipping companies. Generally, allotments are made in the order in which applications are received, but the port authorities have power to grant priority to vessels requiring the use of the dry dock for the least time not exceeding 24 hours and also to damaged vessels. A penalty may be imposed on a ship which stays in the dry dock longer than the period for which she was admitted.

8.7. **Facilities in dry docks.**—As regards facilities in the dry docks, the position is as follows:

Cranes.—There is a 4 ton crane in Kidderpore dry docks between Nos. 1 and 2. There are four 3 ton cranes in King George's dry docks, but these have insufficient reach.

Water supply.—There is adequate supply of unfiltered water in all the dry dock, and recently a tubewell has been sunk near the King George's dry docks from which fresh water for drinking purposes of about 25 tons an hour could be supplied. There is no arrangement for supply of fresh water in the Kidderpore dry docks except by barge.

Electric power.—In King George's dry docks D.C. power of 220 volts up to 500 amps, and A.C. power of 500 volts 3 phase 50 cycles up to 100 amps, are available. A limited supply of A.C. power of 220 volts is also available. In the Kidderpore dry docks, D.C. power of 220 volts up to 50 amps. and A.C. power of 440 volts 3 phase 50 cycles upto 100 amps. are available only in case of emergencies.

Compressed air.—Provision exists for supply of compressed air by means of pipelines alongside the dry docks sufficient for operating ten pneumatic tools at each dry dock.

8.8.1. **Repair berths.**—There are no repair berths, as such in Calcutta. There are two lay up berths in Kidderpore Dock (off 28 and 29) and one in King George's Dock (G berth), which are used by vessels undergoing repairs. They are in the nature of dead berthing space. None of the facilities required for carrying out repairs to a ship alongside a berth such as water, power, compressed air, heavy lift crane, etc., is available at any of these berths. The repairers are required to provide portable generators, welding sets, compressors etc., which necessarily involve transport from to ship and back and results in delays. For heavy lifts they have to depend on the availability of the port floating crane. No barge for discharge of oil sludge is available. There is no good approach road to these berths, nor any hard standing for lorries to come alongside the ship. There are no telephone facilities or customs inspection facilities near the lay up berths. Moreover, these berths have been silting up, with consequent limitations on the draft of the vessels using them.

8.8.2. In view of the position stated above, repair work is mostly carried out in vacant cargo berths when they are available, but their continued availability is uncertain and is dependent on their not being required for cargo work. The ships are, therefore, liable to be shifted at short notice to another berth or asked to bank alongside another vessel or even to move out into the stream. In view of this, even when undergoing repairs, vessels cannot be immobilised and have to maintain steam to be able to move as and when ordered. Besides, as these berths are primarily equipped for cargo work, there are no.

8.9.1. **Plans.**—There is a provision of Rs. 26 lakhs in the Second Five Year Plan for the following improvements:—

8.9.2. It is proposed to provide a 25 ton electrically operated travelling crane and three 3 ton electric cranes in the King George's dry docks. The steam cranes in the King George's dry docks will be shifted to the Kidderpore dry docks. The latter cannot take heavier cranes unless the dock walls are strengthened.

8.9.3. It is proposed to supply at the King George's and Kidderpore dry docks additional compressors capable of operating another ten pneumatic tools at each dry dock. In addition, it is proposed to provide adequate lighting for night work at both the dry docks. It is also proposed to improve the fresh water supply and fire fighting arrangements at the dry docks as a part of the general proposals for improvement of these facilities in the dock area in the Second Plan.

8.9.4. Previously there was a proposal to convert the present lay up berth in the King George's Dock (G berth) into a fully equipped repair berth at a cost of Rs. 60 lakhs, but we understand that this has been dropped for the present as funds are urgently required for acquisition of additional dredgers for the port. There are no plans for providing repair facilities at the lay up berths in the Kidderpore dock or at any other berth in the port.

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8.10. **Dry docks.**—There are two dry docks controlled by the Bombay Port Trust to which the Hughes dry dock is 1000′ long and can be divided into two compartments by suitable positioning of the caissons. It can take ships of deep draft but as entrance to it is from one end only, the difficulties mentioned earlier in respect of King George's dry docks at Calcutta apply here also. The other dry dock, known as Mereweather dry dock is 500′ long and can take ships up to a draft of 22′.

8.11. **Facilities at the dry docks.**—As regards facilities available at the dry docks, the position is as follows:—

.**Cranes.**—A 30 ton electric crane is available at the Hughes dry dock. A Lima 40 ton mobile crane, normally used for heavy cargo lifts, is made available at the Mereweather dry dock. The Lima crane is unable to travel all round the Mereweather dry dock owing to the danger of the underground pipes being damaged, but it is understood that these pipes will shortly be shifted and relaid.

Water supply.—Salt water hydrants are available in the dry docks. Fresh water supply is also available at both the dry docks but the pressure in the mains is so low that it is difficult for ships to draw their requirements, except for about four hours during the night. As the water supply is controlled by the Municipal Corporation, the Port Trust state that until the scheme for laying bigger pipelines is completed by the Corporation, no real improvement can be expected.

Power.—A.C. power of 440/230 volts 50 cycles is available at both the dry docks. D.C. power is not laid on, but the Port Trust have portable motor generator sets up to a total capacity of 100 K.W. at 110 and 220 volts D.C., which are available for use in the dry docks, according to information given to us these are, however, seldom made available for merchant ships.

Compressed air.—This is not laid on, but portable sets are available for Port Trust work or for hire, when available, to private repair firms.

Fire Fighting.—The main reliance is on the municipal fire brigade but the port has an auxiliary fire brigade for emergency requirements.

8.12. **Repair berths.**—There are no repair berths, as such, in Bombay also. Until recently, berths K, L, M, N, O, P, and Q in the Prince's Dock were being allotted to ships under repairs, as the sheds alongside these berths were under-construction and the berths could not be used for cargo work. Now that the sheds have been completed and the berths are in use for cargo work, they are made available for ship repair work only when they are not occupied or required by vessels working cargo. At times berths in the Victoria Dock are also allotted, if vacant. Occasionally berths at the harbour walls have been allotted as repair berths. As far as the Alexandra Dock is concerned, no berth is allotted for repair purposes and ships with deep draft have necessarily to carry out repairs in stream. As repairs are carried out at cargo berths to the extent they are vacant and available, or in stream, the difficulties referred to in Calcutta arise here also, and ships are frequently required to shift from berth to berth before repairs can be completed.

8.13. **Plans.**—With the reported abandonment of the scheme for the modernisation of the Prince's and Victoria Dock which, at one stage, included the provision of an additional dry dock, there seems to be no plan now for the improvement of the dry docks except for a proposal to lengthen the Hughes dry dock by 125′ so as to take in two T.2. tankers. Even this appears unlikely to be carried out in the near future. There are no plans at all for the provision of repair berths or for equipping existing berths with repair facilities in this port.

OTHER MAJOR PORTS

8.14.1. There are no repair berths in the ports of Visakhapatnam, Madras and Cochin, and repairs are carried out either afloat or alongside berths where cargo work is done. There are also no dry docks suitable for deep sea ships at these ports. At Visakhapatnam there is a dry dock of 366′ length belonging to the port. The dry dock is primarily used for the requirements of the port craft and the draft is limited to 13′ 6″. The port authorities have a proposal to lengthen and deepen the dry dock so as to take in their recently acquired dredger. As there is a hill adjoining the dry dock, there are difficulties in widening the dry dock.

8.14.2. At Cochin there is a small dry dock of 240′ length in Candle Island, which is used for docking of and repairs to port craft. This dry dock is fairly well equipped with necessary facilities, but it is not suitable for the requirements of deep-sea vessels.

8.14.3. In Kandla there is a floating dock which can accommodate vessels up to 225′ in length. This is mainly used for the port craft and is not suitable for deep-sea ships.

8.151. **Plans.**—In Cochin the port authorities have in mind the construction of a dry dock as a long term measure, but they are prepared to accept a dry associated with the proposed second shipyard, if it is eventually decided to locate it at that port.

8.15.2. In Visakhapatnam the Hindustan Shipyard has under consideration a proposal to construct a dry dock suitable for deep-sea vessels. A considerable amount of preliminary work has been done on this scheme, but it is understood that it is held up owing to foreign exchange difficulties.

8.15.3. There are no plans for building any repair berths in any of the ports. The Cochin port is, however, building four new cargo berths and the Madras port six new cargo berths as part of their expansion plans. The Visakhpatnam port has also a plan for building a new basin with four additional cargo berths. All the three port authorities consider that there should be no difficulty in equipping one of these new cargo berths at their ports with all necessary facilities like compressed air, electric power, heavy cranes etc., so that they may be used as repair berths, whenever required.

8.16. Briefly, the position in Calcutta and Bombay is that beyond hiring out the dry docks with such facilities as exist and making available ordinary cargo berths for repairs, whenever they are vacant, the port authorities have not taken into account the special requirements of the ship repair industry. Although individually some facilities like crane, power, water, etc., are available in these ports, they are only incidental to the existing general port facilities and, in relation to the needs, entirely inadequate. The necessary facilities for ship repairs have, therefore, to be gathered piecemeal from the general equipment of the port and/or provided by the ship repairer. More or less the same position obtains with regard to the other major ports also. In none of the ports is any berth earmarked for ship repairs. While various improvements have been made during recent years and are being planned for cargo working, there is no corresponding awareness on the part of the port authorities of the need to provide facilities for ship repairs. As a result, this subject has received scant attention both in the past and in the plans for the future.

CHAPTER IX

Time and Cost of Repairs—Clarification of Policy regarding Port Facilities

9.1. In this chapter we shall review the salient features of the facilities available for ship repairs in India and deal with their effect on the time and cost of repairs and the reasons for the present depressed state of the industry and indicate broadly the policy to be adopted for improving the present conditions.

Review of facilities

9.2.1. **Workshops.**—The equipment available with the workshops in India is adequate for most types of repairs in dry docks and repair berths. The workshops have in the past handled a much larger volume of ship repair work than at present, and the expanded capacity is still available. Necessary ancillary industries and organised sub-contractors for specialised work, such as refrigeration, insulation etc., are available. One of the handicaps of these workshops is that they are all situated outside the dock area and, in a few cases at some distance from the docks. This means that labour, materials, portable machinery etc., required for repairs and also the parts removed from ships for workshop action have to be transported by lorries or barges and the incidental customs formalities have to be gone through, thus involving additional costs and delay. Although the workshops have adequate portable equipment, working with such equipment is not conducive to full efficiency. The workshops are also not well equipped for repairs in stream.

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9.2.2. **Dry docks.**—Most of the dry docks used by deep sea ships are owned by the port authorities and are not controlled by the workshops. Allotments are made by the port authorities on application under a prescribed procedure and although, in practice, most of the demands are met, frequently ships have to wait; there is generally no assurance of availability or re-availability of dry docks whenever required. The dry docks have some facilities like cranes, water and power available to a limited extent, but these are not adequate. This often results in delay to ships undergoing repairs.

9.2.3. **Repair berths.**—The most important single factor which affects ship repairs in India is the lack of fully equipped repair berths and the non-availability of even ordinary berths when required. We have already stated that fully equipped berths are not available either with the workshops or the port authorities.

9.2.4. It will be seen from the above that ship repairers in India do not control all the three facilities which are necessary for ship repairs and that they suffer from some disabilities in regard to each of them. Whereas the capacity of the workshops has increased substantially during and after the last war, there has been no increase in the dry dock and berth facilities, which are controlled by the ports. In fact, as we have explained in Chapter VIII, there has been an effective reduction in the berth facilities available for repairs during the last few years. We shall presently show how the lack of berth facilities affects ship repairs work in the ports of Calcutta and Bombay.

9.2.5. **Calcutta.**—With only lay up berths available for all the ships requiring berthing space for repairs at any point of time, the consequences are that—

ships once berthed are moved from berth to berth or from berth to moorings and back, while repairs are still continuing; and

the majority of repairs to ships both major and minor (including machinery and boiler surveys) have to be carried out at moorings.

The difficulties of having to carry out repairs at the moorings are obvious. Firstly, the ship cannot be immobilized. Repairs at the moorings become a continuous time-consuming process of movement of men, materials and mobile equipment, compliance with customs formalities and ordering and getting floating cranes, water barges and oil barges. If dry docking is involved, the ship, after leaving the dry dock, may have to remain idle for want of a berth or be moved to moorings, when the entire process of repairs has to be restarted. This process is not confined only to ships requiring major repairs. With siltation in the port, and consequent reduction in the number of berths available for ships of deep draft, even ships intending to carry out minor repairs, while working cargo, are required to move from berth to berth etc.

9.2.6. **Bombay.**—Hitherto one or the other out of four or five berths in the Prince's and Victoria docks, which were not fully developed as cargo berths were made available, when not required for cargo working. With the completion of cargo sheds alongside these berths, they are not likely to be available as repair berths, except occasionally. Unlike Calcutta, even lay up berths are not available. In this respect the position in Bombay is worse than in Calcutta. Ships under repairs have to move from berth to berth, or berth to stream, and vice-versa, and the same process of time-consuming movement etc., is repeated in this port also.

9.3. In dealing with the seriousness of the situation arising from the uncertainty regarding availability of berths for repairs, we cannot do better than quote a few selected opinions of the various parties interested in this matter.

The Indian National Steamship Owners' Association have stated that the lack of facilities eventually makes the cost of repairs in

India prohibitively high and shipowners are, therefore, compelled to carry out some of the repairs in foreign countries. Some foreign ships, which could come to Calcutta and Bombay for repairs, are presently diverted to Singapore or Hongkong because of the deficiency of facilities.

The Malabar Steamship Company have stated that their "JANETA" had to wait for a month during the months of November and December, 1957 for a repair berth in Bombay. She went into dry dock in January 1958 and required a repair berth again at the end of the month, but could not get one until the end of April, 1958. After some time she had to move out of the berth and complete the rest of the work in stream until she sailed in July, 1958. The avoidable loss of time was about 4 months in this case.

Scindias have stated that the absence of fully equipped berths specifically reserved for repairs at Calcutta and Bombay constitutes the biggest single handicap to ship repairs in India.

The British India Steam Navigation Company have stated that the non-availability of repairs berths is a serious handicap, particularly for passenger ships. The annual surveys of such vessels are conducted under Government and Lloyds Surveyors' supervision, and if berths are not available, not only is extra expenditure incurred but considerably more time is required. They consider that the lack of repair berths is a serious deterrent to shipowners wishing to undertake major repairs at Calcutta and Bombay. It is for this reason B.I. are sometimes forced to despatch their vessels to Japan and Hongkong for major repair work and, now that the Pakistan Industrial Development Corporation Shipyard, Karachi, is functioning, they are allocating vessels to that port also.

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The Mazagon Dock have stated that there are now good possibilities of increased repair work for tankers in Bombay owing to the large number of tankers calling at that port. However, in actual practice, one group of tanker companies which incurred repair expenditure in the region of Rs. 45 lakhs in Bombay in 1952, incurred only an expenditure of under Rs. 2 lakhs in 1955-56. The principal reason for this is the fact that no repair facilities are available for the large size tankers employed by this group. They have also referred to two cases in which B.I. was compelled to arrange special surveys costing Rs. 7 lakhs and Rs. 15 lakhs to their vessels at a far eastern port because facilities were not available in India. In another case, they had to regret their inability to quote for a large repair job because there was no assurance of berth facilities.

The Mazagon Dock have also stated that the volume of repairs to foreign ships at Indian ports has gone down rapidly since 1952 owing to non-availability of berths. They have pointed out that many tankers which discharge cargo in Bombay, proceed to Hongkong and Japan and have their repairs carried out there. If repair facilities are available at Bombay, it is reasonable to assume that a large volume of business would be attracted to the port. They have stated that if berths are allotted for repairs, they would approach tanker companies for regular arrangements for carrying out repairs to their tankers in Bombay.

We may state that practically all the interests concerned unanimously stressed the importance of the availability of fully equipped repair berths in Calcutta and Bombay.

9.4.1. **Effect on time and cost of repairs.**—The direct effect of the lack or inadequacy of the various facilities is to increase the time of repairs. We have already referred in previous paragraphs to some of the factors which contribute to delays in dry docking or carrying out repairs afloat. Most of these delays arise because of the unfavourable conditions in India. The cumulative result of the delays is a substantial addition to the time taken for repairs. For instance, several cases were mentioned to us which go to show that as many as 6 to 10 shifts of a ship during repairs are not an uncommon occurrence. The effect of such shifts on the time of repairs can be easily imagined.

9.4.2. Another important consideration in relation to conditions in India is the cost of repairs. Until a few years back the cost of carrying out repairs in India compared favourably with the costs in foreign ports. In the last few years, the position appears to have changed considerably. It is the view of the interests concerned that the cost of repairs in India now tend to be higher than costs in the Continent of Europe, Hongkong and Singapore and sometimes higher than in the United Kingdom.

9.4.3. It is important to note that the total cost of repairs to a shipowner consist of —

the actual cost of repairs, viz., the ship repairer's bill;

the standing charges for the number of days the ship remains under repair; and

the loss of earnings for the same period.

The impact of delays on the cost of repairs at Indian ports becomes patent in this context. To the extent to which a ship is detained for any extra period due to delays in repairs in India, the standing charges and loss of earnings for this period constitute an additional burden on the shipowner. This addition to the cost of repairs can be substantial in view of the high standing charges of modern ships which are of the order of Rs. 10,000 per day. In arranging for repairs, the ship owner does not consider only the comparative actual costs of the repairs at Indian and foreign ports. To him, the cost of repairs is the total cost. Elimination of delays, is therefore, the decisive factor in retaining and attracting ship repair work to Indian ports.

9.5. It was represented to us that one of the causes of increasing costs of repairs in Indian ports is the lower efficiency of labour. It was also stated that recent labour legislation and the awards of the Industrial Tribunals have contributed to increased costs of labour. Traditionally labour costs in India were lower, and work involving manual labour, like chipping and painting, boiler cleaning, tank cleaning, carpentry and joinery work, has been cheaper in Indian ports, despite the relatively lower efficiency of individual workers. The pattern is, however, slowly changing and the rising labour costs are beginning to affect the existing favourable position. If this process continues, the remedy may have to be found in partial mechanisation.

Repercussions on the industry

9.6. The consequences of the rising costs of ship repairs in India is a gradual but unmistakable diversion of ship repair work from Indian to foreign ports. The recent diversion of some B.I. ships for repairs to Hongkong illustrates the point. It is understood that the total cost comprising the cost of repairs and the time and cost involved in the ballast voyage worked out cheaper than carrying out the same repairs in one of their own associated workshops in India. We have also stated that the traditional pattern of work of most of the workshops in Calcutta and Bombay has been changing, and that the work provided by their associated companies is no longer available to them to the same extent. As a result of these factors, the volume of repair work available to the ship repair industry in India has been going down. The problem facing the industry is, therefore, one of securing adequate work for economic operation. Although the quantum of work available may be expected to increase with future increase of Indian owned tonnage, the workshops will still have considerable spare capacity and they will, therefore, have to canvass a good proportion of work from foreign shipowners. In the case of foreign ships the choice of carrying out repairs at an Indian port or elsewhere cannot be limited in any way and the work can be secured only on the basis of competitive efficiency, *i.e.* comparable time and cost quotations on an international basis. This means that the various deficiencies which now contribute to higher costs in India should be removed. As many of these are beyond the control of the ship repairers, it is necessary that the Government and the various authorities concerned should consider each of such factors with a view to finding solutions for them.

Responsibility of Port authorities and Government

9.7. In view of the importance of repair berths in the picture of ship repairs, we had detailed discussions with the various port authorities on the subject. Our discussions have, however, shown that the requirements of the industry in this respect have not received any recognition. The general view appears to be that the requirements of cargo ships are the main responsibility of the port authorities and that they have little, if any, responsibility in respect of ships needing repairs. The port authorities of Cochin, Madras and Visakhapatnam indicated that they would be willing to equip one of the new berths which they are building or are going to build as a repair berth, so that it may be utilised as such whenever it is vacant. The Calcutta Port Commissioners had a proposal to construct a repair berth, but this has since been given up. All the port authorities were, however, of the view that in the context of periodic congestion of cargo ships, it would not be possible for them to make available any of the existing berths solely for repair work. The Chairman, Bombay Port Trust, was of the view that it was not part of the responsibility of the port to provide repair berths.

9.8. In our opinion, the above view is fallacious and does not take account of the actual conditions in India which are radically different from those in foreign countries, as discussed below:

The port authorities in India own most of the land on the water front in the port area and determine its use. Except by way of lease, acquisition is not possible. Without the fullest co-operation of the port authorities, suitable sites for repair berths cannot be secured by private parties.

By convention and practice, the port authorities in India have always accepted the responsibility of providing repair berths. In view of this, ship repairs did not, in the past, take the initiative in providing themselves with repair berths.

As a practical proposition, there is no possibility in present conditions of any of the repair firms investing the large funds necessary for building special repair berths.

9.9. In view of the above considerations, it is unrealistic to draw any analogy between the conditions in India and those in foreign countries. The reluctance of the port authorities to provide repair berths springs from the experience of periodic congestion of cargo ships. While congestion must be avoided by the provision of additional cargo berths and by other suitable measures, the requirements of ships needing repairs cannot also be ignored. In our view, the provision of facilities for ship repair work, where no separate facilities exist, is as much a part of the legitimate functions of the port as the provision of cargo berths, crane, water, bunkering etc. facilities and dredging. There will be no real solution for the problems of the ship repair industry until this is recognised by the port authorities and the Government.

9.10. We had an opportunity to discuss this subject with Mr. Posthuma, Visiting Adviser on ports to the Ministry of Transport. He felt, in the circumstances explained above, that the problem should be regarded as a national problem and that it should be placed before the Government accordingly.

9.11. We consider that an essential prerequisite for any progress of the ship repair industry is the acceptance of the principle, both by the Government and the port authorities, that it is part of their responsibility to provide for the requirements of the ship repair industry also. We, therefore, recommend that the Government should clarify their policy in this matter accordingly. The problems of the industry have become urgent, and it is important that there should no longer be any ambiguity regarding this matter. As Government have themselves stated in the preamble to the Resolution of 22nd January, 1958, the requirements of the ship repair industry have not been taken into account in the first two Plans and a clarification of policy, as suggested above, would pave the way for the port authorities to provide for the requirements of the industry in future plans.

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CHAPTER X

Recommendations regarding ship repair workshops

10.1. In Chapter VII we dealt with the capacity, turnover and potential of the important private ship repair workshops at the major ports. We also indicated in that chapter that, besides the private workshops, the port authorities have fairly well equipped workshops. In this chapter we shall briefly deal with the role which the port workshops can play in connection with repairs to merchant ships and make recommendations regarding better utilisation and development of the private workshops.

Port Workshops

10.2. The port authorities in Calcutta, Visakhapatnam, Madras, Cochin and Bombay maintain well equipped workshops. There is a workshop in Kandla also, but the installation of the machinery is not complete. When completed, it will also be a well equipped workshop. The facilities available in all these workshops are summarised in Annexure V (A). These workshops are primarily intended for the requirements of the port craft, but they do assist merchant ships in emergency repairs. The port workshops are generally fully occupied with their own work and, in fact, the workshops in Calcutta and Bombay are in arrears in respect of their own work. All the workshops have plans for expansion and modernisation, and it is likely that they will have some surplus capacity in future. In view, however, of the surplus workshop capacity of the private repair firms in Calcutta and Bombay, it is unlikely that the shipping companies will need much assistance from the port workshops at these ports. At the other major ports, private workshop facilities are either unavailable or inadequate. In view of this, it is necessary that the facilities of the port workshops at Visakhapatnam, Madras, Cochin and Kandla should be made available to merchant ships requiring repairs. We, therefore, recommend that, as a matter of policy, the port workshops at these ports should assist the shipping companies in carrying out repairs for which these workshops have facilities.

Hindustan Shipyard

10.3. At Visakhapatnam, the Hindustan Shipyard has facilities for carrying out merchant ship repairs on a significant scale. The Shipyard proposes to lengthen by about 300 ft. its fitting out berth, which can now take 2 ships, and also strengthen it for taking heavy cranes. This will enable a third ship to be berthed but, in the opinion of the Shipyard, it is doubtful if any of the berths will be free or available for long periods for ship repairs in view of the proposed stepping up of its building programme. Even so, the shipyard should be able to carry out repairs to merchant ships by double-banking. For this purpose it will be necessary for the shipyard to equip the fitting out berths with necessary facilities and also build up a separate pool of trained labour for ship repair work. The shipyard appears to be hesitant to embark on such a programme as the ship building side is subsidised by Government and the yard is doubtful whether ship repair work would be profitable In our view there is a strong case for the shipyard to undertake repair work. The expenditure to be incurred by the yard for equipping itself for this purpose would not be large and ship repair work would be generally profitable. The undertaking of repair work would also provide a certain amount of flexibility in the utilisation of labour and workshop capacity and the overheads would correspondingly be spread over. If a dry dock is also built in the port, conditions will be favourable for the shipyard to undertake ship repairs work on a large scale. It may be mentioned here that the major ship building yards in foreign countries are also major ships repair yards. Shipowners would generally prefer to send their ships to the yards where they were built for major surveys as all the drawings required would be readily available. We have also mentioned that if repair facilities for tankers are available at Visakhapatnam they are likely to be made use of by the increasing number of tankers calling there. We, therefore, recommend that the Hindustan Shipyard should, as a matter of policy, extend its activities to ship repair work and take early steps to fully equip itself for this purpose.

Private Workshops

10.4. Most of the privately owned workshops are still using a large proportion of old machines, although some of them have acquired many new medium and small size machines. We feel that if some of the older machines could be replaced by modern type, it would result in considerable saving for them both in labour costs and time. It appears to us that the workshops are unwilling to embark on any large scale plan of modernisation, as they are somewhat uncertain about the future prospects. But once they are assured about the availability of various repair facilities in the port, they would be able to canvass and secure adequate work and be willing to modernise their workshops. We recommend that Government should encourage them to undertake such modernisation, if necessary, with a scheme of financial assistance on favourable terms.

10.5. There are certain items of work which cannot be carried out by the repair firms in India at present. These are enumerated in detail in Chapter XVII. The need for developing facilities for such items is becoming urgent. It is possible that some industrial units which are now being planned like the heavy forging and casting factory at Ranchi may provide facilities for some of these items. The ship repair workshops should be encouraged to develop facilities for the remaining items with such assistance from the Government as may be required. It would be sufficient if, in respect of such items, the facilities are developed only in one workshop each at Calcutta and Bombay, as the others could avail themselves of these facilities as and when necessary.

10.6. We have mentioned that the main problem of the ship repair workshops at present is to secure adequate work and that for this reason, many of them have developed some subsidiary lines of activity. It is not easy for the workshops to switch their capacity to general engineering work on a large scale. Nor would this be a real solution to their problem as the wide variety of tradesmen engaged on ship repair work cannot all be employed on general engineering work which could absorb only labour of selected types in certain departments. Moreover, it is not desirable to allow any such diversion on a substantial scale, as it is necessary to preserve the existing capacity for ship repair work. Nevertheless, the undertaking of other would absorb at least a part of the surplus capacity of the workshops, and for this reason, we consider that the Government should encourage the development of other activities by these workshops. The following are some of the lines in which the workshops could develop such activities:—

Building of small size vessels for the navy, port authorities, other Government departments, shipping companies etc.

Structural and general engineering activities; and

Manufacture of auxiliary equipment and spares for ships and for general engineering industries.

Obviously the necessary schemes in these matters can only be prepared by the workshops themselves and the initiative must come from them. The Government, should, however, adopt a policy of assistance by encouraging Government departments to place orders for small craft, structural and general engineering items etc., with these workshops.

CHAPTER XI

RECOMMENDATIONS REGARDING DRY DOCKS

11.1. In this chapter we shall deal with the question of adequacy of the existing dry dock facilities and the steps to be taken for their improvement by the port authorities and the private sector respectively. The position needs to be considered in detail only in respect of the ports of Calcutta and Bombay, as there are no large dry docks at the other ports

DRY DOCKS CONTROLLED BY THE PORT AUTHORITIES

11.2. We have already dealt with the existing dry dock facilities at the ports in Chapter VIII and these are also summarised in Annexure VI. In order to consider the question of adequacy of the existing dry docks, we requested the port authorities in Calcutta and Bombay to furnish us with information for the last three years regarding the interval between the time when vessels were ready to dry dock and the time when they actually entered the dry dock. This would have enabled us to judge whether ships had to wait for unduly long periods for securing dry docks. The port authorities did not, however, have complete information on the subject and they have furnished us only with statements showing the dates when vessels were actually docked and the periods for which the vessels actually occupied the dry docks. We later took up the matter with the Indian National Steamship Owners' Association, but they were also unable to give us any precise data regarding the periods of waiting for dry docks. They have explained that from the time of initial application for a dry dock to the date of actual docking, the process of getting a dry dock is a matter of continuous enquiry, telephonic or oral, in respect of which no records are kept. They have stated, however, that, in practice, vessels needing dry docks have often had to wait for long periods, but that it is difficult for them to substantiate this statement, as the information available in the records of the port and the companies relates only to the dates on which the vessels were originally expected to be ready to dock and the dates on which they actually entered the dry dock. In these circumstances, we are able to offer only general comments on the subject. If a precise analysis is to be made in future, it will be necessary to ask the port authorities and the shipping companies to maintain complete data regarding the dates of application, the indicated dates of readiness for entering the dry docks, the periods applied for, the dates of actual readiness and entry into the dry dock and the actual periods of occupation of the dry dock.

11.3.1. We shall now examine the data regarding utilisation of dry docks which we received from the port authorities in Calcutta and in Bombay.

11.3.2. According to the information furnished to us by the Calcutta Port Commissioners, the dry docks remained vacant and were used for port craft for the following periods during the three years 1955, 1956 and 1957:—

Dry dock	Number of days vacant				Number of days used for Port Commissioners' craft			
	1955	1956	1957	Ave.	1955	1956	1957	Ave.
K. G. No. 1 .	171	126	171	156	5	1	..	2
K. G. No. 2 .	115	39	88	81	98	17	105	73
K. P. No. 1 .	72	44	75	64	130	25	50	68
K. P. No. 2 .	92	24	58	58	107	224	77	136

11.3.3. It was however explained to us that the above figures of vacant periods were somewhat misleading owing to the following reasons:—

A dry dock is recorded as vacant although the ship scheduled to occupy it is unable to move in.

The arrival of ships sometimes depends on the tide in the river.

The two dry docks in King George's dock are in tandem.

Some time is required for adjusting blocks between dry dockings.

Dry docks are also recorded as vacant when repairs are carried out to the dry dock and its equipment.

In general terms, the port authorities have stated that since 1957, the dry docks have been more or less fully utilised and that they have also been able except in cases of occasional buncing, to meet all demands without unreasonable delays.

11.4.1. The Bombay Port Trust has not given detailed information regarding actual periods for which the dry docks were vacant but, according to the information furnished by them, both the dry docks do not appear to have been vacant for lack of demand for any significant period during the years 1956, 1957 and 1958.

11.4.2. They have stated that the dry docks were used by Port Trust and naval vessels during the years 1956, 1957 and 1958 as follows:—

Year	Number of days			
	Port Trust vessels		Naval vessels	
	Hughes	Mereweather	Hughes	Mereweather
1956	147	74	11	..
1957	86	53	45	..
1958	265	68	57	16
Average	166	65	38	5

It will be seen that the Hughes dry dock, which is the main dry dock for deep drafted merchant vessels, is used to a considerable extent by port and naval vessels.

11.5.1. It is apparent from the information given to us that, both in Calcutta and Bombay, the larger dry docks are used to a considerable extent by port craft. There were several complaints, that in many cases, it was unnecessary for the port craft to have used the larger dry docks and that the work also took an unduly long time. There is also a feeling that in the matter of allotment of dry docks, there is a tendency to show preference to the vessels of the port authorities. Reduced utilisation of dry docks by the port craft would be doubly beneficial, as this would make the dry docks available to an increased extent for the use of merchant ships and also increase the revenues of the port by way of dry dock charges. We shall now examine the possibilities of reduced use of the larger dry docks by port craft at both the ports.

11.5.2. **Calcutta.**—With regard to the periods for which the dry docks have been used by the Port Commissioners vessels, it was stated that four dredgers and two floating cranes have necessarily to use the bigger dry docks, but otherwise the port craft generally use Kidderpore dry dock No. 3, the Island workshop dry docks or the slipways. It was also mentioned to us that the King George's dry dock is used only to the minimum extent necessary.

11.5.3. During our enquiries it also came to light that when the port vessels are dry docked, the port workshops, which invariably carry out the repairs, work only one shift, thereby extending the period of occupation of the dry dock. A few instances were mentioned to us in which the port craft occupied the dry docks for months whereas, had the work been done in more than one shift, the time could have been considerably reduced. It apears that, because the port authorities do not have to take account of the dry dock hire charges and the added 'on cost', the incentive to complete the repairs quickly does not exist.

11.5.4. We recommend the following arrangements for the use of the dry docks by the Port Commissioners vessels. There are only six port craft which necessarily have to use the larger dry docks. These may continue to use the larger dry docks (King George's dry docks and Kidderpore dry docks Nos. 1 and 2) for their requirements. When these craft require the use of the dry dock for long periods, they may preferably be docked in King George's dry dock No. 1. All other craft should, as far as possible, be docked on the port slipways, the Island Workshop dry docks and Kidderpore dry dock No. 3, and they may use the larger dry docks only when it is unavoidable. When the port vessels are docked in the larger dry docks, the port authorities should arrange for work to be done round the clock so that it is completed in the shortest possible time.

11.5.5. **Bombay.**—In Bombay the larger dry docks have been used to a considerable extent by port craft. The Port Trust Workshops carry out the repairs to the craft and they normally work only one shift. The Bombay Port Trust has several slipways which can dock vessels of upto 300 tons and a draft of about 10 feet. Owing to siltation, however, the draft now appears to be limited to about 8′. From the figures for the years 1956, 1957 and 1958 furnished by the Bombay Port Trust, it is observed that 25 power propelled vessels out of a fleet of 53 vessels were docked in the Hughes or Mereweather dry dock. With the completion of several deep drafted craft now under construction for the port authorities, it is expected that some 30 craft will in future be of such draft and dimensions that they cannot be docked on the port slipways. The demand for the larger dry docks for use by port craft is thus already substantial and is likely to increase in future. This will, further, limit the availability of the larger dry docks for merchant vessels.

11.5.6. We, therefore, recommend that the Bombay Port Trust should construct a small dry dock near the port workshop large enough to take all the port craft which cannot presently be docked on their slipways. When such a dry dock is constructed, all port craft should, as far as possible, be docked in this dry dock or the port slipways and they may use the larger dry docks only when it is unavoidable. Pending the construction of such a dry dock we recommend that whenever the port craft use the larger dry docks the port authorities should arrange for the work to be done round the clock so that it is completed in the shortest possible time.

11.6.1. On the basis of the information available, it appears that there is at present considerable pressure on the port dry docks both in Calcutta and Bombay. We feel, however, that the implementation of the recommendations made by us will ease the pressure on the dry docks at both the ports and enable them to meet the present level of demands as also for some years to come. The reduced use of the dry docks by the port craft on the liners recommended by us, will make them available for merchant ships, to a greater extent than is the case at present. Similarly the provision of improved facilities at the dry docks as recommended by us will shorten the period of dry docking of ships and thus enable a larger number of ships to make use of the dry docks.

11.6.2. The position in Calcutta is, on the whole, easier than in Bombay. Even in Bombay, with the construction of an additional dry dock by the Navy, the Navy's demands on the Hughes dry dock will be reduced in future. With the increased use of the Ritchie and Mogul dry docks by merchant ships, on the lines recommended by us, and later, with the construction of a small dry dock for the exclusive use of the port craft, we feel that the existing port dry docks should be able to meet the present level of demands as also those that may arise in the near future We also consider that, in order to make the ship repair industry more broadbased, dry docks should be built in Visakhapatnam on the east coast and Cochin on the west coast. This will also reduce the pressure on Calcutta and Bombay. Hence if any additional dry docks are to be constructed they should preferably be constructed in Visakhapatnam and Cochin rather than in Calcutta and Bombay. In view of the above considerations, we feel that there is no need to consider the provision of additional dry docks for merchant ships at Calcutta and Bombay for the present. The position may, however, be reviewed at the end of the Third Plan period in the light of the conditions then prevailing.

IMPROVEMENT OF FACILITIES IN THE DRY DOCKS

11.7. In the preceding paragraph we considered the adequacy of dry docks at the ports of Calcutta and Bombay. We shall now proceed to make detailed recommendations regarding improvement of facilities at the dry docks at these ports.

CALCUTTA

11.8.1. We have already referred to the provision of Rs. 26 lakhs made in the Second Plan for improvement of facilities at the dry docks in Calcutta such as heavy lift electric crane at King George's dry dock, additional compressors, flood lighting etc. We urge that these improvements should be carried out before the end of the Second Plan period. The 25-ton travelling crane proposed to be provided at the King George's dry dock should have a span to reach the far side of the vessel and the proposed additional compressed air supply should be sufficient for at least 20 pneumatic tools.

11.8.2. We also recommend that the following further improvements should also be carried out by the end of the Second Plan period.

King George's dry docks

11.8.3. D.C. power should be provided at 110 volts upto 200 amps. for portable lights and tools and for ships requiring power at this voltage.

A.C. power for welding and compressor sets at 440 volts 3 phase 50 cycles should be increased to 200 amps.

Drinking water for workmen with leads at convenient points should be provided.

There should be adequate sanitary arrangements near the dry docks for workmen and ship's personnel.

Arrangements should be made for providing the ships in the dry docks with telephones.

The steps of the dry docks are in a state of disrepair. They should be repaired and the rails renewed so as to provide safe access to the dry docks.

Kidderpore dry docks

11.8.4. As there is no heavy lift crane in these dry docks, the floating crane should be made available on a preferential basis for ships using them.

The proposed additional compressed air supply should be sufficient for at least 30 pneumatic tools.

D.C. power should be increased to 200 amps. as follows:—

220 volts to 200 amps.

110 volts to 200 amps.

A. C. power supply	Same as recommended for the King George's dry docks.
Drinking water supply	
Sanitary arrangements	
Telephone facilities	

11.8.5. It was pointed out to us that the side walls of the Kidderpore dry docks would have to be strengthened before a heavy lift crane could be installed. Although we have, as an interim measure, recommended above that the floating crane should be made available on a preferential basis for these dry docks, we consider that these dry docks should be renovated during the Third Plan period and a 15-ton travelling crane, with a span to reach the far side of the ship, permanently provided.

BOMBAY

11.9.1. We have mentioned that there is no plan in Bombay for the improvement of the dry docks except a proposal to lengthen the Hughes dry dock by 125′ so as to take two T.2. Tankers. This proposal can be considered independently of the other major schemes for modernisation of the docks. We urge that this should be taken up for execution as soon as possible and completed early in the Third Plan period.

11.9.2. We recommend that the following further improvements should be carried out by the end of the Second Plan period.

Hughes dry dock

11.9.3. Compressed air supply by means of pipelines laid alongside the dry dock sufficient to operate at least 20 pneumatic tools should be provided.

Permanent arrangement should be made for D.C. power supply at the following voltages instead of relying, as at present, on small portable motor generator sets:—

220 volts upto 200 amps.

110 volts upto 200 amps.

Drinking water for workmen with leads at convenient points should be provided.

There should be adequate sanitary arrangements near the dry docks for workmen and ship's personnel.

Arrangements should be made for providing the ships in the dry dock with telephones.

Salt water supply should be augmented by providing larger capacity pumps, especially in view of the fact that tankers require considerable quantities of water for resting of tanks, which is a normal requirement when tankers are in dry dock.

Fresh water supply is expected to improve after the Bombay Municipal Corporation has completed laying of bigger size pipe lines. However, as a permanent facility for the dry dock, we recommend that a reservoir of suitable size may be constructed near the dry dock for fresh water supply to ships in the dry dock.

Mereweather dry dock

11.9.4. A 15-ton travelling crane with a span to reach the far side of the vessel should be provided solely for the use of this dry dock.

Compressed air supply D. C. Power supply Drinking Water supply Sanitary arrangements Telephone facilities Salt water supply Fresh water supply	Same as recommended for the Hughes dry dock.

Other dry docks

11.10. **Privately owned dry docks.**—There are no privately owned dry docks in India suitable for deep sea ships except the Ritchie and Mogul dry docks in Bombay, both of which are controlled by the Mazagon Dock. We have already pointed out the factors which limit the use of these dry docks in Chapter VIII. If the Bombay Port Trust and the Mazagon Dock co-operate, it will be possible to achieve increased utilization of these dry docks. We consider that, in the over all interests of the Port, the Port Trust should be prepared to accept responsibility for dredging and maintenance of the channel and approaches to these dry docks. The Mazagon Dock, on their part, should be agreeable to incur capital expenditure on lengthening and deepening the Ritchie dry dock which would make it suitable for docking large merchant ships. They should also not be averse to hiring out the Mogul dry dock to shipping companies who wish to utilise the services of ship repairing firms other than the Mazagon Dock. There should not be any serious practical difficulties in making the Mogul dry dock available as suggested above in view of its location outside the workshop area of the Mazagon Dock. In this connection, it will be relevant to point out there has been less than 25 per cent. utilization of the Mogul dry dock over the past three years.

11.11. **Indian Naval Dockyard.**—The Indian Naval Dockyard at Bombay has at present four dry docks of different sizes and a large new one is under construction. While these dry docks are primarily intended for the use of naval vessels, merchant ships may, on occasions require their use for short periods for routine dry docking, examination for underwater damage, etc., when other dry docks are not available. We recommend that, in these circumstances, the Indian Naval Dockyard should make available its dry docks for merchant ships to the extent their own work permits.

Other Ports

11.12. **Visakhapatnam.**—For the reasons which we have discussed earlier in this chapter we recommend that the scheme under consideration by the Hindustan Shipyard for the construction of a dry dock should be taken up for implementation at an early date. The dry dock should be a large one and should be capable of accommodating T.2. type tankers which are likely to visit the port in increasing numbers. The construction of such a dry dock will avoid the necessity of vessels built at the Yard having to proceed to Calcutta for dry docking before delivery as at present. It will also stimulate the development of a good ship repair industry in the port. The proposal of the port authorities for lengthening and deepening their dry dock should be considered in the light of the recommendation we have made above.

11.13. **Madras.**—There is no dry dock in this port and the port slipway is used for repairs to port craft. In view of our recommendation that a dry dock should be constructed at Visakhapatnam, we do not consider the provision of a dry dock at this port necessary at present. There are a few small seagoing vessels based on this port which do not at present have any dry dock or slipway facilities. We recommend that the use of the port slipway for docking such vessels should be permitted.

11.14. **Cochin.**—The siting of a dry dock in Cochin will stimulate the ship repair industry in this port and the considerations which we mentioned in the case of Visakhapatnam apply here equally. We accordingly recommend that the construction of a fully equipped dry dock, either as a part of the second shipyard scheme or otherwise, should be planned and completed by the end of the Third Plan period.

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CHAPTER XII

RECOMMENDATIONS REGARDING REPAIR BERTHS

12.1. In Chapter IX we have explained how the ship repair industry in India is seriously handicapped owing to the non-availability of repair berths and recommended that the Government and the port authorities should accept the responsibility for providing them. In this chapter we shall examine the extent to which repair berths are required, both from the short term and the long term points of view, and also the facilities to be provided at the berths. We shall deal with the position in detail in respect of Calcutta and Bombay as these are the main repair ports. Our recommendations will, however, cover other major ports also.

Calcutta and Bombay

12.2. In order to enable us to judge the number of repair berths that are required in Calcutta and Bombay, we endeavoured to collect information regarding the actual number of days during which ships underwent afloat repairs in berths, anchorages, etc., and also the time lost in waiting for the berths. The information is not, however, readily available. We have, therefore, tried to assess the number of repair berths required at Calcutta and Bombay on the basis of materials otherwise available to us.

12.3.1. **Estimate of repair berths required.**—It will be seen from Annexure VIII that the Indian merchant fleet at present comprises about 140 ships. On the basis of orders already placed, there will be an addition of about 20 ships during the remaining period of the Second Five Year Plan, making a total of 160 ships. On an average, one fourth of this fleet will have to undergo special survey every year, which means that in every period of 12 months not less than 40 ships of Indian registry alone will require berths for special survey repairs between Calcutta and Bombay. The time taken by ships at the repair berths during special survey varies depending upon the age of the ship concerned, but assuming an average stay of 30 days per ship, the number of berth-days comes to approximately 1,200. This figure does not, however, take into account the requirements of:—

Annual surveys of passenger and passenger-cum-cargo vessels.

Repairs to vessels suffering accident or damage. Running repairs.

Assuming that the time required for the above items is about 25 per cent., of the time required for special survey the total number of berth days will come to roughly 1,500.

12.3.2. According to the information available to us, out of approximately 1,600 liner vessels which call at Calcutta and Bombay about 30 ships in Calcutta and 40 ships in Bombay undergo special or annual or other surveys every year at these ports. Some of these ships are passenger ships undergoing regular annual surveys. Assuming an average stay of 15 days per ship at the berth in the case of these ships, the number of berth days comes to 1050. It may be taken that at least 100 ships out of the total number of foreign ships which carry out some running repairs at each of these ports, would require repair berths; and assuming a stay of 3 days per ship at the berth, the number of berth-days for these ships would come to 600. Thus the total for both Indian and foreign ships works out to 3,150.

12.3.3. From the above figures, it will be seen that a minimum of 8 berths (3150 ÷ 365=8 approximately) is required continuously to meet the present demand for repair berths between Calcutta and Bombay. Having regard to the anticipated additions to the Indian fleet during the Third Plan period, and the increased demands for repair facilities from foreign ships, the minimum requirement at the end of the Third Plan period will be 12 berths. The above calculations have been made on a conservative basis and we feel that actual requirements will be even higher. Although a part of the total requirements may continue to be met by the use of vacant cargo berths, we consider that it is necessary progressively to provide separate fully equipped repair berths as this will lead to greater efficiency and economy. We, therefore, recommend that the provision of 12 fully equipped repair berths for both the ports should be accepted as the ultimate target.

12.4. We shall now proceed to indicate in what stages this ultimate target of six repair berths each at Calcutta and Bombay should be achieved. We have shown that there is a proved need for a minimum of four berths in each of these ports even for current requirements. In view of the serious difficulties experienced by the ship repair industry and the crisis through which it is now passing, we feel that immediate relief should be afforded to the industry by earmarking and improving the berths which have hitherto largely been used for ship repair work. On this basis we shall make specific recommendations separately for Calcutta and Bombay in regard to the steps to be taken in the remaining period of the Second Plan and in the Third Plan period, respectively.

12.5.1. **Calcutta.**—In Calcutta there are three lay-up berths viz., off 28 and 29 in Kidderpore dock and 'G' berth in King George's dock, which are largely used for ship repair work. We recommend that these three berths should be earmarked for ship repairs and that they should be equipped with the following facilities during the remaining period of the Second Plan:—

All the three berths should be dredged so as to have a minimum depth of water of 18′ alongside the berths.

Short piers capable of taking one 5/10 ton travelling crane should be constructed alongside each berth.

Good approach roads leading to the piers should be constructed.

Arrangements should be made for supply of A.C. power at 440 volts 3 phase 50 cycles upto 200 amps. for compressors and welding sets.

Arrangements should be made for supply of D.C. power at 110 volts and 220 volts upto 200 amps. for ships' lighting and power.

Supply of drinking water for workmen with leads at convenient points should be provided.

Adequate supply of fresh water for ships should be provided.

Copious supply of unfiltered water for testing of tanks should be provided.

Sanitary arrangements near the berths should be provided.

Arrangements should be made for providing the ships at the berths with telephones.

Proper mooring facilities should be provided for testing ships' main engines after completion of repairs.

Flood lighting on the pier should be provided for night work.

12.5.2. We recommend that provision should be made in the Third Plan for the following further facilities at each of the piers:—

A travelling crane of 5/10 ton capacity. Compressed air supply by means of pipelines laid alongside the pier sufficient to operate at least 20 pneumatic tools.

12.5.3. In order to achieve the target of six repair berths recommended by us, it will be necessary to provide for three additional berths in the Third Plan. We recommend that the 'H' berth in the King George's dock should be adapted and equipped as a repair berth. We understand that there is a proposal to construct a new basin in the King George's dock in the Third Plan. We recommend that two of the berths in the new basin should be constructed as repair berths as part of that plan.

12.6.1. **Bombay.**—In Bombay, due to the reconstruction of sheds at most of the berths in Prince's and Victoria docks and the absence of lay-up berths, as in the case of Calcutta, used only for ships under repair, we find it rather difficult to specify the berths for ship repairs. We also appreciate that it may not be possible to provide any berth in Alexandra dock for ship repairs. In view of this and due to the proximity of Prince's and Victoria docks to the major workshops, we consider that the requirements of repair berths will have to be provided for in these docks only. We accordingly make the following recommendations:—

12.6.2. The K. L. M. berths inside Prince's dock have been used in the past for ships needing repairs. The inner northern half of these berths should be reserved for ships under repair. Similarly the northern half of N and O berths in Prince's dock should be reserved for ship repairs.

12.6.3. We understand that at No. 10 in Victoria dock a shed is under construction. After this shed is completed, the use of No. 9 as a cargo berth will be restricted. This berth should, therefore, be earmarked for ship repairs.

12.6.4. All the 3 berths mentioned above should be fully equipped with the various facilities as mentioned in the case of Calcutta during the remaining period of the Second Plan and in the Third Plan period.

12.6.5. In addition to the above, one berth in the outer dock wall should be made available as a repair berth during fair weather. It should be dredged to maintain a minimum depth of 18′ and equipped with necessary facilities.

12.6.6. To achieve the target of six fully equipped repair berths in Bombay, we recommend that the Kassara Basin should be put into use as a repair basin for medium sized vessels. This will necessitate dredging of the basin and the approach channel, fitting of a lock gate, strengthening the piers and providing various repair facilities. This will provide two additional repair berths and should be included in the Third Plan.

12.6.7. Apart from the above, if any scheme is prepared in future for the construction of new basins or docks in Bombay, we consider that two fully equipped berths for repair purposes should be planned as part of the scheme.

12.7. **Other ports.**—We recommend that in the ports of Visakhapatnam, Madras and Cochin, one of the new berths which are under construction or are to be constructed, should be fully equipped with necessary facilities for ship repairs. These berths need not be exclusively reserved for ship repairs but should be made available on a preferential basis for repair purposes, whenever there is a demand. In Kandla, there is no need to consider the provision of a separate repair berth for the present.

Other facilities in docks.

12.8. **Sludge tanks/sludge barges.**—At present there is no provision for receiving oily water sludge from the tanks of the ships undergoing repairs and consequently the sludge has to be transferred from tank to tank during special surveys. We, therefore, recommend that at least two sludge barges of approximately 100 tons capacity each should be provided at Calcutta and Bombay. These barges should be made available for discharge of sludge as and when required by ships undergoing repairs. We also recommend that, at both the ports, shore sludge, tanks should be provided with suitable pipe lines so that the sludge barges can discharge the sludge into these tanks.

12.9. **Workshop cum office in docks.**—We recommend that space should be made available to the principal repair firms at the major ports in the dock area for maintaining a small workshop-cum-office. Facilities should be given to use a part of the premises for a small bonded store.

12.10. **Garbage bins.**—We recommend that suitable sized garbage bins should be provided both near the dry docks and the repair berths to collect waste materials from the ships.

CHAPTER XIII

MINOR PORTS

13.1 We mentioned in Chapter II that we made enquiries of both Indian and foreign shipping agents as to the minor ports at which they carried out repairs, if any, to their ships and the extent of such repairs. The replies received indicate that hardly any repairs of significance are carried out at any of the minor ports. Only emergency items which cannot be postponed are carried out in these ports. The facilities actually available at the minor ports are summarised in Annexures V(B) and VI. From these it will be seen that, almost uniformly throughout the country, on both coasts, facilities at minor ports, which are mostly anchorage ports, are limited to small slipways suitable for docking the craft owned by the port authorities. In some ports there are also workshops capable of carrying out minor maintenance or running repairs. In many cases, the port craft have to proceed to other nearby ports where facilities exist for major repairs or surveys. We are of the view, however, that there is scope for improving the existing facilities at the ports mentioned below to serve the needs of small coastal vessels for dry docking and repairs as also of deep-sea ships for repairs afloat. Such improvements will augment the overall facilities available for small vessels on both the east and the west coasts and make them broad based.

13.2.1. **Mandapam.**—The workshop at Mandapam is owned by the Railway and is mainly intended for carrying out necessary repairs to the two Southern Railway ferry steamers sailing between Dhanushkodi and Talaimannar. There is a dry dock of 264′ length and 50′ width close to the workshop. Ships of up to 12′ draft only can use the channel leading to the dry dock. The dry dock has been primarily built for the ferry vessels and there are no plans of deepening or lengthening it. There is also a slipway of 140′ × 90′ × 4′ with provision for operating 3 cradles the hauling capacity of each cradle being upto 50 tons. This slipway was built by the Navy and is not now in use as all equipment has been dismantled after the war. Apart from the ferry vessels, the dry dock is now being used to dock Madras State Fisheries vessels, the Bucket Hopper Dredger of Tuticorin Port and some privately owned ships. Even so, the dry dock is not fully occupied.

The workshop is well equipped and staffed for carrying out complete hull and machinery repairs to the ferry vessels. The spare capacity of the workshop is utilised for the manufacture of items of stores for the mechanical and engineering departments of the Railway and other Government departments.

13.2.2. Mandapam offers good alternative dry docking facilities on the east coast with repair facilities for small coastal vessels. We recommend that the dry dock should be lengthened and deepened so as to be able to dock vessels of 350 feet length and 15 feet draft and the approach channel dredged during the Third Plan period. The slipway should also be brought into use by providing necessary equipment for docking and repairs to small vessels and craft plying in the area. We also recommend that the Railway, should, as a matter of policy, undertake repairs to privately owned vessels.

13.3.1. **Tuticorin.**—There are practically no facilities for ship repairs in this port except for a few machine tools on the port dredger. There is no slipway or regular port workshop, and repairs to the port craft are carried out in the Railway worshop at Mandapam. The Sethusamudram Canal Project Committee has recommended the construction of the canal and also the development of Tuticorin as a major port, including the construction of a dry dock in that port. It is understood that certain traffic and engineering surveys are being conducted with a view to enabling the Government to consider the recommendations of the Committee.

13.3.2. We understand that Tuticorin is likely to be developed as a major port in the near future. We recommend that the development of repair facilities viz., a fully equipped repair berth and workshop should be considered as part of the general project.

SAURASHTRA PORTS

13.4. Of all the minor ports on either coast, the repair facilities [illegible] Saurashtra ports are best developed. It has five fairly well developed intermediate ports handlink considerable cargoes, viz., Bhavnagar, Okha, Bedi Bunder, Veraval and Porbander. The need for self-sufficiency in the matter of repairs to port craft, which taken together are numerous, has led to the development of sizeable repair facilities at these ports. The basic facilities which exist are sufficiently diverse and broad-based for carrying out improvements so as [illegible] extend the facilities for the use of merchant ships.

13.5.1. **Bhavnagar.**—In the old port area there is a dry dock of 25[illegible] length and 40′ width. Immediately adjoining the dry dock, the port has now constructed a sheltered barge basin. The dry dock is [illegible] present able to take all the craft of Bhavnagar and neighbouring ports. The barge basin provides necessary facilities for construction and repairs of the barges belonging to these ports. Facilities for fresh water and power are available at the dry dock. The port has also a workshop situated near the dry dock and the basin, with equipment essential for repairs to 11 types of port craft. The workshop has, in fact, carried out extensive hull and machinery repairs to the Port dredger. There is ample space around the dry dock and the workshop area. Alcock Ashdown have acquired a site near this area for erecting a workshop. They have already put up a shed and are now engaged in the construction of steel barges for the port.

13.5.2. In view of the above, we recommend that the existing dry dock should be extended and deepened so as to dock vessels of 350′ length, 45′ breadth and 15′ draft. We also recommend that the port, as a policy, should allow its workshop to undertake repairs to privately owned vessels. The workshop should also be expanded for this purpose.

13.5.3. In the new port a lock gate at the entrance of the concrete jetty is under construction to provide a deep water basin. This basin will have a constant depth of water and provide several berths suitable for ships of deep draft. We understand that there will be no difficulty in setting apart one of the new berths exclusively for ship repair work and in allotting an adjacent plot for a workshop. We also understand that the Bharat Line have a scheme for setting up a workshop at the port. In view of the proximately of Bhavnagar to Bombay, the development of repair facilities at the port will help relieve the pressure on Bombay. We, therefore, recommend that one of the new berths should be earmarked for ship repair work and fully equipped with all repair facilities.

13.6.1. **Okha.**—The port has a concrete jetty alongside which medium sized ships can be berthed. It has also a wharf-wall of 225′ length for the discharge of lighters. There is no dry dock or slipway in the Port, but there is a proposal to construct a slipway of 270′ length and 55′ width which will take vessels upto 11′ draft. There is a small port workshop not well equipped at present. Proposals for improving the workshop are under consideration.

13.6.2. In view of the large number of vessels which call at this port, we recommend that the workshop should be equipped for carrying out maintenance and running repairs to merchant ships.

13.7. **Bedibunder.**—The Port has a dry dock of 230′ length. It has also a barge basin with a clear entrance width of 22′. The entrances to the dry dock and the barge basin are separate. Vessels can be docked and undocked only on certain days during the month on high tides. The barge basin is suitable for docking all port barges and small launches, while the dry dock is able to take care of all repairs to ships up to the size of an L.C.T. There is a 3-ton crane on one side of the dry dock near the entrance. Power and water are also available. The floor of the dry dock requires renovation and so also the lock gates. There is a small well equipped workshop which adjoins the dry dock and the basin. The port builds its own barges, buoys etc. The workshop can undertake repairs to all types of craft. This is an anchorage port where ships anchor 6/7 miles out at sea from the harbour. The use of the dry dock by merchant vessels is not possible. It is understood, however, that the Navy and the oil companies may be interested in making use of the dry dock and repair facilities at this port for small vessels like mine-sweepers, oil barges etc. We, therefore, recommend that the dry dock should be renovated and the lock gates repaired.

13.8. **Veraval.**—This is an anchorage port with ships normally anchoring more than a mile out at sea. In addition to overseas and coastal traffic, it caters for sailing and fishing vessel traffic. The

State Government has undertaken an extensive programme of development of the port for fishing vessels. The programme provides for sheltered basins within the port, with one wharf of 600′ length with 8′ water alongside at low water and another of 1000′ length where the depth varies from 8′ to 14′ alongside. The port has a dry dock 135′ long and 180′ wide with clear entrance width of 35′. The port has also a small workshop near the dry dock which can carry out all necessary repairs to port craft. There is a crane alongside the dry dock and water and power are available. There is ample space around the dry dock and workshop area. The dry dock was hitherto used as a sheltered wet basin for sailing vessels during the monsoon, but as ample berthing space will, in future, be available in the harbour, the dry dock could be used for docking small vessels and for sailing vessels which are mechanised.

13.9. **Porbander**.—There is a provision in the Second Five Year Plan for a dry dock of 250′ length which will enable vessels of 8′ draft to be docked at high tide. For the purpose of docking port craft, it would be a useful addition to the existing over-all facilities at Saurashtra ports.

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CHAPTER XIV

SHIP REPAIR MATERIALS AND SHIP STORES

14.1. Our terms of reference in regard to materials require us to consider whether materials, stores, etc. required for ship repairs are available adequately within the country or whether the country is deficient in this respect; if the latter is the case, we have been asked to recommend what steps should be taken for reaching self-sufficiency in this field as far as possible.

14.2. In considering this subject, it would be desirable to assess the total requirements of both the ship building and ship repair industries, as the types of stores, materials etc., required are similar. The ship building industry is essentially an assembly industry and, as such, its output depends on the ready availability of requisite materials. The availability of materials without delay is even more important in the case of the repair industry, as the demands for particular materials or parts may arise suddenly and the time available for completing the repairs would be generally limited. Although the ship repair industry has been in existence in this country for many years and the ship building industry for over a decade, both are still primarily dependent on imports for most of the items. During recent years, some of the items have been manufactured indigenously and are available in small quantities, but their supply is not sufficient to meet the demand. Although units for the manufacture of some of the items exist in India, the deliveries are considerably delayed; in some cases, the factories concerned complain of shortage of raw materials. In respect of some items, the quality is not up to the prescribed standards. At the same time, the restrictions on imports have been considerably tightened and actual users' licences very much curtailed, particularly in respect of items which are manufactured in India, with the result that the items are not readily available to the repairers either from within the country or from abroad.

SPECIAL POSITION OF SHIP REPAIR INDUSTRY

14.3.1. It would be useful to refer at this stage to certain special features of this industry, which distinguish it from the other manufacturing industries.

14.3.2. We have already referred to the fact that this industry has to complete, unlike other industries, with the ship repair industry in foreign countries and that the demands for materials or parts arise suddenly, especially in cases of damage repairs etc. The repair firms would, of course, keep a range of stores in stock subject to their financial limitations, but it will obviously be necessary to import unavailable stores from abroad. The time factor is of utmost importance in competing for repair work and, if there is difficulty or delay in getting the materials for procedural or other reasons, the shipowner may well decide to carry out the repairs at a foreign port where the materials are easily available.

14.3.3. We have also mentioned that this industry assists both in earning and saving of foreign exchange. Although foreign exchange expenditure has inevitably to be incurred on import of stores, the industry earns several times this expenditure.

14.3.4. The industry cannot easily do with equivalents or substitutes. The rules and requirements of the Government and/or of the Classification Societies have to be complied with as otherwise the appropriate certificates will not be issued and the ship cannot sail. Any relaxation of these requirements is also not desirable because the risks involved are large and the facilities available under operating conditions on the high seas are not the same as on shore.

14.3.5. The wishes of ship owners have also to be taken into account. The use of certain materials has been developed after years of trial and experience of all maritime countries. Some of these materials have to be imported if they are not locally available. Substitutes may be found locally, but their use may not always find favour with shipowners. For instance, some of the workshops mentioned to us that some British owners insisted on the use of lignum vitae for stern tube bushes for their ships, although this items is subject to severe import restrictions and a good indigenous substitute is available.

14.3.6. The import of certain types of spares and parts cannot be avoided. These are mainly proprietory items which have to be obtained from the original manufacturers. For instance, spares for diesel and steam turbine engines on Indian ships have to be imported. Owing to delay in imports, either the ships are held up or temporary repairs are required to be carried out which are expensive and uneconomic in the long run.

14.3.7. In view of the above considerations while the policy of progressive manufacture of these items should be pursued, it is necessary to take a liberal view of cases such as mentioned above and allow sufficient imports of these materials if the ship repair industry is to be in a State of competitive efficiency.

14.4.1. In considering this subject further, it would be desirable to deal with the items required for ship repairs and maintenance under three heads, viz.

"Materials" including all raw materials, ferrous and non-ferrous, such as steel plating and rolled sections, timber, piping, boiler tubes, cables, bolts, nuts and rivets, forgings, castings, etc. which would require further processing and fabrication in the worshops:

"**Ancillary equipment**" consisting of fully manufactured items which have merely to be installed on board ship including:—

- (i) Deck auxiliaries including lifeboats, davits, anchors, windlasses and winches, hatch covers etc.,
- (ii) Hull fittings like rudders, stern frames, stern tubes, propellor shafts,
- (iii) Engine room auxiliaries like generators, pumps, compressors, refrigeration equipment, heaters, electrical equipment etc.,
- (iv) Firefighting equipment,
- (v) Sanitary appliances,
- (vi) Navigation instruments and other bridge equipment,
- (vii) Steel, cast iron, copper and lead piping and pipe fittings including valves, cocks etc.,
- (viii) Miscellaneous items *e.g.*, kitchen equipment, gangways, accomodation ladders, water tight doors, porthole fittings,
- (ix) Wooden and plastic interior fittings; and

"**Spares**" costing of spare parts of main and auxiliary machinery on board ship, e.g., pistons, liners, cylinder heads, piston rings, fuel injection equipment, turbine blades etc.

14.4.2. We shall now proceed to deal with the above in the order of their mention.

AVAILABILITY OF MATERIALS

14.5.1. **Steel.**—One of the items about which we heard persistent complaints from ship repairers was the delay and difficulty in obtaining their requirements of steel, which is one of the most important items needed by the ship/repair industry. It is stated that generally some 16 sizes of plates and several sizes of structurals are required for the industry including sheets, bars, section angles, bulb angles, channels, etc., and these have to be tested to Llyods specifications, e.g., B.S.S. 13. Specially tested plates and materials are required for boiler and machinery repairs.

14.5.2. It is understood from the Iron and Steel Controller that the supply of tested plates is at present very limited. Only Tatas produce shipbuilding plates and this too only up to 6′ width. Their production is also far short of the requirements of the shipbuilding and ship repair industries. In view of the limited size and quantity of plates available in the country, it is necessary to make up the balance of the requirements by imports.

14.5.3. We shall now briefly explain the procedure for allotment and supply of quotas of steel to ship repairers. Being an engineering industry under Central Government control, the sponsoring authority for the ship repair industry is the Development Wing of the Commerce and Industry Ministry, and all applicants for quotas have to obtain a licence and register themselves under the Industries (Development and Regulation) Act, 1951, with that Wing. There are 21 firms registered with the Development Wing as being engaged in ship repair work and construction of coastal boats and river craft, of whom 19 are registered for the purpose of allotment of steel from the Central Steel Processing Industries (S.P.I.) quota. The remaining two firms have not approached the Development Wing for steel and presumably obtain their supplies through the State Governments. A statement showing the names of registered firms, their assessed capacity and allotments made to them is attached as Annexure IX. From this annexure it will be seen that the total requirements of all categories of steel of these registered firms come to about 13,000 tons per annum. (This figure does not include the requirements of the Hindustan Shipyard).

14.5.4. Under the existing procedure, these registered firms have to apply to the Development Wing every quarter for their requirements. The Iron and Steel Controller gets advance information from the steel producers regarding their production programmes and makes bulk allotment of steel of various categories to the Development Wing. The Development Wing thereupon issues quota certificate to individual firms taking into account their past consumption and the categories applied for. The Development Wing generally gives high priority to the requirements of the ship repair industry. On receipt of the quota certificates, the firms place their detailed indents on the Iron and Steel Controller, who plans and places orders on the producers for the production of different categories or arranges for release from registered stockists. Against the unfulfilled quotas, the Iron and Steel Controller arranges for import of steel on Government account to the extent foreign exchange is available and distributes it at pooled prices. Sometimes he is able to obtain steel from foreign countries as part of barter deals. In special cases where the Iron and Steel Controller is unable to arrange imports, the Development Wing recommends the issue of import licences to individual firms.

14.5.5. One of the complaints about the present procedure which was brought to our notice was that there was delay in the allotment of steel quotas. For example, Scindias have mentioned that this delay may be anywhere from 2 to 4 months. Another complaint made to us was regarding the serious time lag between the issue of quota certificates and actual supply. It was stated by the Iron and Steel Controller that this interval was of the order of 6 to 9 months and that this was due to the rolling mills having to plan their production on the basis of orders, but the ship repairers stated that the interval was much longer. We also found that, although the ship repairing firms held fair to adequate stocks for immediate requirements, they had large arrears against their quotas which were yet to be supplied. For instance, Garden Reach gave the following figures of quota allotments and actual receipts by them:—

	Quota	Quantity received
	Tons	Tons
1956-57	1,200	482
1957-58	2,487	354
1958-59 (two quarters)	1,234	1

Mazagon Dock stated that against their quota from 1956 (upto 31-5-1958) totalling 2783 tons, they actually received 959 tons.

14.5.6. A defect in the existing procedure is that there is no provision for meeting any emergency requirements of shipping companies. There are also some small repair firms who are not registered with the Development Wing but as worker's sub-contractors or are patronised by some shipowners. At present these firms are not able to get their requirements of steel at controlled prices. In these circumstances, some shipping companies have applied through the Directorate-General of Shipping for special releases of steel, but this has also not produced quick results. It is, therefore, desirable that there should be provision in the scheme to cover such cases.

14.5.7. The position as ascertained by us is that the supply of steel, the largest single basic item required for ship repairs, is severely limited by the overall shortage of indigenous production and foreign exchange available for imports. In the slow and elaborate procedure of assessment of capacity, fixation of quota, issue of certificate, classification into categories, planning of production with the producers, release from stockists, arranging for imports etc. there is so much delay involved that steel is not available, when wanted, for an industry in which ready availability of supplies is of great importance. The allotted quotas are practically never fulfilled. Even when the quota in terms of total tonnage may be partially fulfilled, being carried forward from quarter to quarter, the supplies under specified categories are, in practice, never commensurate with the indents of the firms on the Iron and Steel Controller.

14.5.8. The Iron and Steel Controller informed us that the position regarding steel plates would ease steadily with the plans of Tatas to step up their production of plates to 1 lakh tons and of Rourkela to produce 2 lakhs tons of plates upto 109" width. He was of the view that the position would ease by the third quarter of 1960 and that, under such improved conditions of supply, the need for imports would largerly disappear and even non-registered firms would be able to get their requirements from the market at normal prices. He also expressed the view that the supply of most of the other categories of steel required for ship repairs would also improve when all the three Government steel plants go into production.

14.6.1. In spite of the above hopeful picture, we are afraid that conditions of overall shortage will remain with us for some years to come. In order to afford relief to the industry during this period we make the following recommendations.

14.6.2. In view of the special position of the ship repair industry, the Development Wing of the Ministry of Commerce and Industry should continue to give high priority to the steel requirements of this industry and also take steps to ensure that avoidable procedural delays are eliminated. We understand that the issue of quota certificates is now centralised in the Development Wing and we recommended that arrangements should be made for the issue of quota certificates before the end of the quarter to which they relate.

14.6.3. The Iron and Steel Controller must make every possible effort to fulfil the quotas allotted to ship repair firms to the fullest possible extent. To the extent to which such quotas cannot be fulfilled from indigenous producers or stockists, the repair firms concerned should be enabled to obtain the balance from abroad by issue of necessary import licences. It is necessary that the allotted quota should not only be fulfilled in terms of the total tonnage, but also of the specified categories applied for.

14.6.4. In order to meet the emergency requirements of shipping companies and small ship repair firms not registered with the Development Wing, the Iron and Steel Controller should on the recommendation of the Director General of Shipping, who may be the sponsoring authority for such cases make an ad hoc supply available without delay to the company or firm concerned either from the producers or stockists.

14.7. We also recommend that the entire position should be reviewed, after the three Government steel plants have been in production for some time, in consultation with the all India Advisory Body whose formation we are recommending in Chapter XVI.

14.8. **Timber.**—Most indigenous varieties of timber used in ships are easily available. Imported timber usually comprises Oregon Pine and Lignum Vitae. Oregon Pine is used for dock sheathing, hatchboards, cargo battens etc. The import of this wood is stopped and the ship repairers are unable to accept and fulfil orders due to shortage of this timber and have to use indigenous substitutes which are not wholly satisfactory. Lignum Vitae is used for lining stern tubs and rudder gudgeon bushes of ships, but its import is very much restricted. A substitute known as Red Ebony, available in India, has been found to be satisfactory, but we heard complaints, particularly in Calcutta, that regular supplies of this timber were not available. It was also mentioned that some shipowners insisted on the use of Lignum Vitae. The quantities required of these two varieties of foreign timber are small and we recommend that imports of required quantities should be allowed until regular supplies of indigenous substitutes are available.

14.9.1. There are various items in regard to which the ship repair industry depends entirely on imports, e.g., special steels (nickle chrome, molybdenum etc.) stainless steel, tool steels, abrasives, electrodes, copper ingots, Zinc etc.

14.9.2. There are certain items of equipment and portable tools required by ship repairers e.g., welding sets, welding transformers, air compressors, pneumatic hammers and drills, cutting and drilling tools, measuring instruments etc., not yet manufactured in India which have to be imported.

14.9.3. **Other items of materials and ship stores.**—There are several other items of materials and ship stores which are now partially manufactured in India. Some of these are as follows:—

Boiler tubes.—upto 2½" are made by the Indian Tube Company, Jamshedpur, but supply is very difficult. Tubes over 2½" have to be imported.

Pipes.—M. S. between ½" and 3" diameter are made by the Indian Tube Company, Jamshedpur, and the Kalinga Tubes, Cuttack. Other sizes of pipes and solid drawn tubes are not manufactured at present. It is stated that manufacture of solid drawn tubes upto 7″ diameter will commence this year. Sizes of M.S. pipes and solid drawn tubes, which are not planned for manufacture, have to be imported.

Electric cables.—Some types of cables manufactured in India have not yet been approved by major Classification Societies and these cannot be used on ships. Armoured cables are not manufactured in India. Such cables have to be imported.

Packing and Jointings.—Except for a few categories of jointings manufactured in India, all other types of jointings and packings have to be imported by actual users. It was complained to us that there was an acute shortage of packings and jointings commonly used on ships.

Steel wire ropes.—Black and galvanised wire ropes of sizes ¾″ to 3½″ circumference are manufactured in India, but the supply is both inadequate and delayed. Galvanised unkinkable wire ropes for lifeboat falls are not manufactured at present in India.

Galvanised sheets.—Although Tatas manufacture sheets of 12, 14, 16 and 24 S.W.G., supplies are very restricted. In the event of proved non-availability imports have to be allowed.

Electrical accessories.—Such as resistances, relays, automatic switches, etc., being replacement parts, have to be imported.

14.9.4. There are numerous other miscellaneous items which are required for ships and which have to be imported. Some of these items are:—

Pressure gauges
Gauge glasses (Bishops')
Ebonite tubes or quills
Port glasses
Refractories
Freon & Arcton gas
Ball bearings
Ships' pyrotechnics
Smoke-helmets
Safety lamps
Thermometers
Thermostat equipment
Gas leak detecting equipment
Electronic stores (condensers, valves etc.)

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14.10.1. Most of the above items are required by ship repairers. Under the existing procedure, ship repair firms are recognized as Established Importers for import of certain materials required for ship repairs and as Actual Users for workshop spares and equipment. In both cases, and, particularly as Established Importers, their licences have been subject to drastic cuts in recent years. **Since these items are absolutely essential for ship repairs, they should have the same preferential treatment as raw materials have for other manufacturing industries.**

14.10.2. Many of the items of materials and ship stores enumerated above are the normal requirements of shipping companies and they are not necessarily stocked and supplied by ship repair firms. Since these items are required for normal maintenance of ship's machinery and equipment or at the time of major surveys, they are usually obtained by shipping companies direct from the market. Until the time severe import restrictions were enforced, most of these items were imported and stocked by ship chandlers, who were granted import licences for the purpose. As the licences granted to ship chandlers as Established Importers have now been drastically curtailed, most of these items are not available. The shipping companies, therefore, have been forced to apply for ad hoc licences for these items and their applications are submitted to the Import Control Authorities through the Directorate General of Shipping, who recommend them after due scrutiny. Under the present Import Control Policy shipping companies are not recognised as Actual Users, and consequently the licences are either not granted or granted after considerable delay, and their values are often drastically reduced.

14.10.3. Ship chandlers are the traditional suppliers of many of the items of materials and ship stores both to Indian ships and foreign ships visiting Indian ports. It is desirable that they should continue to import and supply these items, and to the extent such stores are supplied to foreign ships, the foreign exchange expenditure incurred is more than fully recovered.

14.11. **Ancillary equipment.**—Most of the items under this head have to be imported at present. Even in foreign countries these are usually manufactured by ancillary industrial units which specialise in them, and some of the types are patented or controlled by proprietary firms. In the absence of industries producing all these diverse types of equipment in this country, ship builders and repairers have necessarily to depend on imported equipment for fitting out ships or for carrying out repairs.

14.12. **Spares.**—It has been brought to our notice that considerable difficulty is experienced in respect of import of bonafide spares for the main and auxiliary machinery of ships, particularly diesel engines, turbines, electrically driven engine room and deck auxiliaries navigational and radio equipment, etc. Most of these items have to be imported from the original manufacturers, since they are governed by proprietary rights, are of very specialised nature and are standardised for interchangeability. In all maritime countries it is the normal practice to replace the various parts of modern diesel engines, turbines, etc. at specified intervals. All such spares are required to be examined and tested by the surveyors of Classification Societies and/or Government and the certificate must accompany the spares concerned. Further, these spares are not mass produced. They have therefore to be ordered well in advance and the ships have to carry a stock of such spares on board. Under the present procedure in respect of import of spares, the shipping companies experience the same difficulties as in the case of ship stores. An additional factor which causes delay in the matter of import of spares is that applications for such import are at present being screened from the point of view of availability from indigenous sources. This is not necessary as diesel engines of the types and horse power installed on board ship and their spares are not at present manufactured in India. Hence, import of these spares has to be allowed to the required extent.

MANUFACTURE IN INDIA

14.13. The problem of indigenous manufacture of materials and equipment bristles with many difficulties. In many cases the quantities involved are so small that it will be uneconomic to undertake local manufacture. The possibility of standardisation of some of the items and also of pooling the requirements of various parties like shipbuilders, repairers, navy, port authorities, etc., should be examined. After the type and quantities to be manufactured have been assessed, the question as to which individual firms have the best facilities for undertaking their manufacture should be considered. It will be necessary to arrange for the testing of the products by Government and Classification Society surveyors and repair firms before they are marketed. There is also the difficulty that some of the equipment is of high precision quality and the technique has yet to be developed within the country. It will be necessary to review the progress of the industries in respect of various items from time to time. In these circumstances, as we have already indicated in Chapter II, we have come to the conclusion that the subject of progressive manufacture of these items is a vast subject requiring considerable time and study and that the Committee on Ancilliary Industries, which is a standing committee, is in a better position to pursue it. We are, therefore, making no recommendations on this subject.

14.14.1. We have already pointed out that, for the efficient functioning of the ship repair industry, it is important that it should be able to obtain easily its requirements of materials and equipment by imports where supplies from indigenous sources are not available or are insufficient. Similarly, shipowners should be able to import their requirements of essential spares and ship stores for maintenance purposes without undue difficulty. We have also referred to the part played by ship chandlers in the supply of ship stores to Indian and foreign ships. Under the present arrangements, severe restrictions have been imposed on imports of all such materials, spares, ship stores, etc. The special considerations in respect of ship repairs and maintenance have not been taken into account and the imports are subject to the same policy restrictions as other classes of imports. We consider that, in order to remove the present difficulties, the overall import needs indicated above should be dealt with separately from those of other industries/importers and provision made to meet them directly. We accordingly make the following recommendations:—

14.14.2. A special foreign exchange quota should be established for the ship repair industry for import of materials required for ship repairs and workshop spares and equipment. The quota should be sufficiently large to meet the needs of the industry. It may be administered by the Development Wing of the Ministry of Commerce and Industry and a liberal licensing policy should be followed in respect of the imports, subject to proved non-availability from indigenous sources.

All policy questions concerning the fixation of this quota, its administration etc., should be dealt with in consultation with the all India Advisory body which we are recommending later.

14.14.3. A special foreign exchange quota should be established for the import of spares, ship stores, etc., required by shipping companies. This quota may be administered by the Directorate General of Shipping, who will scrutinise the essentiality of the requirements. This quota should be fixed taking into account the requirements of the shipping companies. All policy questions concerning the fixation of this quotas, its administration etc., should be dealt with in consultation with the Indian National Steamship Owners' Association.

14.14.4. The decisions of the Development Wing and the Directorate General of Shipping as to the necessity for imports should be accepted by the Import Control Authorities for issue of licences.

14.14.5. A more liberal policy in regard to imports of essential ship stores by ship chandlers should be followed subject to scrutiny as to quantities applied for and non-availability in India.

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CHAPTER XV

CUSTOMS PROCEDURE

15.1. Although customs procedure is not one of our terms of reference, we propose to deal with it in some detail as it has considerable impact on the ship repair industry. The present procedure, in its day to day working frequently results in delays in the completion or repairs. This is one of the factors which seriously affect the ability of ship repairers in India to make competitive quotations of time and cost of repairs. The problem has several faces like clearance of ships' parts for repairs, removal of condemned materials, clearance of parts imported from abroad, etc. We shall first state the nature of the difficulties experienced and then discuss some improvements which were suggested to us. The problem is primarily of importance with respect to Calcutta and Bombay, as these are the main repair ports, but the difficulties and delays occur at other ports also.

MACHINERY PASS SYSTEM

15.2. Taking first the questions of clearance of machinery parts between ships and shore workshops before and after repairs, the matter was, prior to 1956, regulated by the Machinery Pass Rules issued by the Customs Department. Under these rules, the ship repair firms were allowed to pass such materials without payment of duty either by lodging a permanent deposit with the customs authorities or by executing a separate guarantee on each occasion. The ship repair firms generally made a permanent deposit and were granted a general pass under which they were able to clear machinery parts, both to and from the workshops, without undue difficulty. The check whether the parts removed or brought back tallied with those stated in the pass, was made at the gate.

15.3. In August 1956, the procedure was changed and more elaborate arrangements were introduced. Under the new procedure, the repair firm have to make a deposit and execute a stamped letter of guarantee, agreeing to abide by the rules under the new procedure, empowering the customs authorities to forfeit the amount of deposit for any breach of the rules and also authorising any customs officer to enter the workshop or office of a repairer at any time. When any machinery part is to be removed from the ship to the workshop for repairs, the ship repair firm has to make out a machinery pass in each case in quadruplicate, duly signed by the ships' officer concerned and a supervisor of the repair firm, and submit it to the customs authorities. The customs officer concerned then permits the landing of the machinery after necessary verification on board of the description, quantity, value, etc. by endorsing all the copies, of which he retains the original. The officer may, in cases in which the articles are not likely to be re-shipped or where the value declared appears unduly low, detain the articles for appraisement. Articles declared as condemned are sent for immediate assessment of duty. The customs officer at the gate makes a physical verification that only the goods mentioned in the pass are being cleared and endorses the remaining three copies of the pass, of which he retains one for transmission to the Custom House. On return of the goods from the workshop, the customs officer at the gate makes a similar check and endorses the third and fourth copies of the pass. When the goods are brought back to the ship, the above copies are required to be signed by the ship's officer and supervisor of the repair firm. Thereupon, the customs officer concerned checks that they are actually reshipped and endorses these copies accordingly and retains the third copy with him. The third copy together with the original, is then passed on by him to the Custom House for record.

15.4. Although the procedure is basically the same both in Calcutta and Bombay, the actual administrative arrangements and the nature of the problems which have arisen are slightly different at these ports. We shall now deal with them in detail.

15.5. *Calcutta.*—As regards the actual arrangements in Calcutta, where a ship is loading or discharging cargo in the docks, the customs officer assigned to the ship is authorised to sign the machinery pass. In other cases, the customs officer at the appropriate check post has to be contacted and his signature obtained and, where parts are taken to a workshop by launch, *e.g.*, from a ship moorings, the launch has to be taken to Outram Ghat, where a customs officer is stationed during working hours. No customs officers are stationed in the premises of the repair firms.

15.6.1. The main criticism of the existing arrangements falls under two broad heads. The first is that, owing to the elaborateness of the procedure, numerous difficulties arise in its day to day working. Some instances of the actual difficulties experienced are given below:—

15.6.2. Every ship has to obtain a rotation number from the Custom House and this number is required to be inserted in every machinery pass relating to the ship. This number can be obtained only during the working hours of the Custom House and, if the ship arrives outside working hours or arrives in a place away from the Custom House like Budge Budge, there is delay in getting the number. Until the number is obtained, it is not possible to remove or ship any parts for repairs. This is a serious difficulty, particularly in the case of tankers which call at Budge Budge only for short periods.

15.6.3. The filling of the machinery pass with all required details and getting them signed by the ship's officer, supervisor of the repair firm and the customs officer entail considerable delay in actual practice.

15.6.4. At the time of carrying the parts back to the ship, the original copy retained by the customs officer is required to be traced by the repair firm's representative for checking with the repairer's copy. Serious delay often results in tracing the copy lodged with the customs officer.

15.6.5. When a vessel shifts from one berth to another or from moorings to docks or *vice-versa*, the original copy lodged with the customs officer is forwarded to the customs check point at the new berth. Frequently there is delay in transmitting the document and often it gets lost, with the result that a further copy has to be prepared, and re-shipment of the machinery part is delayed.

15.6.6. If the machinery parts taken out for repairs are not returned to the ship before she leaves the port they have to be shipped on her next call. The repairer is then required to secure the original copy from the Custom House. This copy is frequently not traceable and, even if traced, cannot be obtained without loss of time.

15.6.7. It was stated by Hooghly Docking that the customs authorities were reluctant to accept the machinery passes from the workmen, lorry drivers, or attendants but insisted that a foreman or supervisor should be available to explain the items mentioned in the pass. As they had limited supervisory staff, this entailed unnecessary waste of time. Garden Reach stated that they had to maintain a special staff of gunners exclusively for this work.

15.7.1. The other type of difficulties experienced arise from the deficiencies in the administrative arrangements. It was stated that—

(a) there are too few customs check posts;

(b) the staff is inadequate; and

(c) the staff is rarely available outside working hours.

15.7.2. With regard to (a), it was stated that there was no customs post in or near the Kidderpore dry docks and all formalities had to be complied with at Nos. 5 and 7 sheds; similarly for ships in the coal docks, the formalities had to be complied with at No. 22 Kidderpore docks on the other side of the docks, which entailed crossing the swing bridge. Likewise, for ships berthed between 11 K.P.D. & 21 K.P.D. and off 28 and 29 K.P.D., the machinery pass had to be obtained from the customs shed at 28 K.P.D. For ships lying in river moorings, even in Matiabruz, the permission had to be obtained from the Outram Ghat.

15.7.3. As regards (b) and (c), it was mentioned that customs officers were available only from 8 a.m. to 5 p.m. on working days and from 8 a.m. to 2 p.m. on Saturdays. Owing to inadequate staff, the available officers were sometimes busy with other work and were not available to deal with machinery passes promptly when approached. No customs officer was available on Sundays and holidays, except for specific cases on special requisition in advance and on payment of over-time fees. It was not possible to anticipate in advance what emergency repairs would arise and what parts would have to be removed. Under these conditions it was practically impossible to remove parts for urgent repairs until the next working day.

15.8.1. *Bombay.*—The arrangements in Bombay are slightly different from those in Calcutta. There are customs officer stationed in the premises of the Mazagon Dock and the Scindia Workshop, who check the arrival or clearance of machinery parts at the workshop gates or at the adjoining bunder gates if parts are brought by launches. As regards the docks, these are divided into sections and only the section officer concerned with the dock in which the ship is lying is empowered to sign the machinery pass. Articles are allowed to be landed from vessels in stream moorings and taken to the Mazagon Dock or Scindia Workshop, but in such cases the machinery pass is required to be signed by the boarding officer. The boarding officer in these cases is the customs inspector at the Custom House in charge of the customs officers stationed at these workshops. The boarding officer sends suitable advice to the bunder gate concerned and, if the vessel later moves to the docks, he transfers the papers to the section officer concerned. Some instances of the difficulties experienced in Bombay are as follows:—

15.8.2. It is often difficult to locate the section officer and to get him to visit the ship concerned for signing a machinery pass. There are not enough section officers and sometimes a full day is lost in the process.

15.8.3. Difficulties similar to those experienced in Calcutta arise when a ship is shifted.

15.8.4. There are no arrangements for issue of machinery passes outside working hours and on Sundays and holidays, except by special arrangements in advance and on payment of overtime fees. It may be mentioned that the Mazagon Dock and the Scindia Workshop have also to bear the expenditure on the customs staff posted in their premises.

15.8.5. There are often difficulties in assessment of value and such cases are referred to the Custom House with resulting delay.

15.8.6. There are no arrangements for clearing lorries through the gates of the port during the lunch interval.

CLEARANCE OF SPARES, MATERIALS ETC.

15.9. Another type of difficulty arising from customs procedure is in connection with the shipping of materials, spares and replacements fabricated in the workshops or imported from abroad and removing of condemned materials or parts from ships. At present such items are shipped on shipping bills for free goods (Form CH. 412). These are generally prepared by the repair firms and they have to get them endorsed by the ship-owners or agents and then by the Custom House. It is stated that the shortest period which the Custom House takes to pass them in 48 hours and often it takes a longer time.

10.10.1. Some of the specific difficulties arising from the present procedure which have been mentioned to us are as follows:—

15.10.2. Even items specially manufactured locally for a particular ship like hatch boards, shifting boards etc. can be shipped only after negotiating shipping bills through the customs. Similarly for portable plants, oxygen cylinders etc. required for repairs elaborate formalities have to be gone through.

15.10.3. Transfer of spares from a foreign going ship to a coasting ship is extremely difficult and is rarely allowed even where both the ships belong to the same owner. This is presumably due to the distinction made for customs purposes between 'foreign' and 'coasting' ships; consequently spare parts from 'foreign' ships have to be cleared inward through customs before they can be transferred.

15.10.4. A foreign-owned vessels arriving for repairs and having on board special spares or materials which are not available in India, cannot land them for workshop action before fitting, without elaborate guarantees including liability to pay customs duty and any fine or penalty imposed by the customs or import control authorities. If any customs guard is posted at the workshop for the purpose, the charges have to be borne by the workshop.

15.10.5. Guarantees are similarly required when, in the course of repairs, it becomes necessary to land ashore items like oil drums, bunker oil, stores, Deck Planking etc. Such items, when kept in port trust bond, are not allowed to be re-shipped until near the time of sailing and sometimes part of the consignment is found missing, with resulting complications and liability to duty.

15.10.6. In the case of foreign-going ships, when spare parts are imported from abroad by air for urgent repairs, there is often delay in getting them on board ship. Even after the imported parts are put on board under customs supervision, they cannot be immediately fitted on the ship. Under the existing rules, they can be fitted only on the next call of the ship when such imported parts are treated as forming part of the ship's equipment. The only way to put them to immediate use is to clear them formally through customs as imports after payment of duty.

15.10.7. Difficulties are sometimes experienced in clearing parts which are condemned or spares which have become obsolete, but which the owner may wish to retain for possible future use. Such items have to be invariably cleared after assessment and payment of duty. In some cases original invoices, which may not always be available, are required to be produced. Sometimes the assessment of value is high and generally there is delay in going through the procedure.

15.11. We feel that most of the above difficulties have arisen because the existing procedure does not appear to have been evolved with the special needs of the ship repair industry in mind. In this connection we shall refer to certain points mentioned by the Mazagon Dock in the course of their evidence. They have pointed out that the Sea Customs Act and the rules issued thereunder are primarily designed to deal with landing of passengers, baggage, cargo, levy of customs duty etc. and do not contain any provisions directly applicable to ship repairing and that the procedures applicable to these matters have been mechanically extended to ship repairs. They have stated that the revision of the machinery pass system in 1956, which was considered to be a tightening up by the customs authorities, has, from the ship repairer's point of view, aggravated an already inflexible procedure which does not lend itself to the needs of the ship repair industry, the essence of which is *speed*. They have mentioned that the ship repair work on the scale undertaken by them operates on a series of repeating 'guarantees' executed with monotonous regularity with the customs. Their concern lies in the time taken to enter into the guarantees and also the strict impositions which could be made against a ship repairer for any error which may unwittingly be made by anyone in a large establishment.

15.12. Whatever the correctness of the legal position stated above may be, there is little doubt that the present procedure affects the ship repair industry adversely in that it inevitably results in increasing the time and cost of repairs. For this reason, we recommend that the entire policy should be reviewed and necessary changes made in the procedure.

15.13. Taking first the machinery pass system, the previous system of issuing a general pass and of checking the goods at the gate was changed into one of individual passes and of checking on the ship, presumably with a view to obviating smuggling. While the purpose in view is unexceptionable, one cannot help feeling that the interests of the ship repair industry have been ignored, or to some extent, even sacrificed. In view of the crisis through which the industry is passing, it is necessary that each of the factors which affect the competitive position of ship repairers in India should be examined afresh, having due regard to the difficulties experienced by them. We have explained that in regard to the machinery pass system the present difficulties are mainly due to the elaborateness and complexity of the procedure. It is easy to visualise how in cases of emergency repairs or large scale repairs, these difficulties can cumulatively lead to avoidable loss of valuable ship's time or increase in costs. We, therefore, recommend that a new procedure should be evolved bearing in mind the special need of the ship repair industry which, while protecting Government's interests, should be simple in operation and eliminate the factors inhibiting the industry at present.

15.14. It is clear that the two factors which militate against speed are the preparation, filing and subsequent tracing of several copies of the machinery pass and the requirement that a customs officer should inspect every consignment on the ship before removal and on return. The latter will always be a serious problem unless the Government can increase the strength of the customs staff considerably, which may not be feasible. In our view it would be sufficient if the master of the ship or the Chief Engineer, as a representative of the ship-owner, and the supervisor, as a representative of the ship repairer, sign the machinery pass. A copy of this pass duly endorsed by the customs officer at the gate should be passed on to the Custom House within a stipulated period. This will, in effect, mean reverting to the general pass system, but some approach to this system is inevitable if any real improvement is to be effected. However, to protect Government's interests, it may be stipulated that an overriding guarantee should be furnished by the shipowner or the agent and the ship repairer, accepting responsibility for the actions of their respective officers in connection with the working of this system. In order to further reduce the delays, it is suggested that one or two gates in each dock may be specified through which only all lorries carrying ship repair materials and parts should pass both outward and inward.

15.15. We appreciate that the consideration of the changes in policy and procedure on the lines recommended by us may require some time. The difficulties experienced under the present procedure, however, are so acute in relation to expeditious handling of ship repairs, that we consider that some immediate improvements in the existing administrative arrangements are called for until such time as the above recommendations are considered and implemented.

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15.16. One of the most serious difficulties at present is the non-availability of customs officers when required. It is, therefore, necessary that an adequate pool of customs officers, both during and outside working hours should be made available so as to cut down delays.

15.17. As regards the actual improvements to be made, the following suggestions were put forward by the interest concerned.

The customs staff handling machinery pass work should be strengthened.

The Collector should formally authorise all customs inspectors available in the dock concerned to assist in all matters connected with removal or return of machinery parts.

During the hours 5 P.M. to midnight, two customs officers for each dock should be available for this work at known addresses, with telephone facility, where they could be contacted without delay.

From midnight upto 8 A.M. one customs officer for each dock should be available for this work at a known address with telephone facility. Similar arrangements should be made for Sundays and holidays.

These suggestions apply to both Calcutta and Bombay and we recommended that they should be accepted and implemented by Government.

15.18. *Other ports.*—We heard complaints in Cochin and Madras also that considerable time is spent in complying with customs formalities for taking tools etc. to the ships and also in bringing parts to the workshops for repairs and returning them to the ships. We consider, however, that these difficulties would be overcome if changes are made in the procedure on the lines recommended by us.

15.19. Coming to the difficulties regarding shipment of spares etc. we have pointed out that they arise because the classification of ships into 'foreign' and 'coasting' ships for export and import trade purposes is not strictly relevant for shipment landing of apares or machinery parts. This view is supported by the fact that such items are non-consumable items and are not subject to duty. These items eventually become a part of the fixed equipment of the ship concerned. For these reasons, we recommend that they should be treated differently from ship stores and they should be allowed to be shipped freely subject to such formal documentation as may be prescribed for record purposes. To ensure that only *bonafide* repair materials are shipped, it may be stipulated that a responsible officer of the shipowner, the agent or the ship repairer should certify the items which are proposed to be shipped.

15.20. We also recommend that no restrictions should be imposed except those required for record purposes on the fitting of new parts on ships undergoing repairs by transfer of parts from another ship of the same owner or from bond or by import from abroad. We also recommend that shipowners and ship repairers should be allowed to avail themselves of bonding facilities on a liberal scale and at a reasonable cost, so as to make them to maintain a stock of spares, old parts or imported items for issue to ships. Such facilities are available to a limited extent in Bombay but are not available in Calcutta. This facility would greatly assist the industry in cutting out avoidable delays in obtaining or supplying spares required during repairs.

CHAPTER XVI

GOVERNMENT CONTROL AND ADVISORY MACHINERY

16.1. In our questionnaires to the various parties, we enquired whether they considered that any form of Governmental control in respect of ship repairs would lead to an improvement in the existing conditions. From their replies we find that it is more or less the unanimous view that there would be no advantage in any Governmental control in this matter. They emphasise that adequate engineering facilities for repairs are available and that the real difficulties arise from the inadequacy of port facilities and the restrictions on the import of essential materials and equipment. They consider that efforts should first be directed to overcoming these difficulties. We agree with this view.

16.2. We also enquired whether they considered it desirable that any advisory or consultative body, central or local should be set up to deal with matters relating to ship repairs. On this question, there is no direct expression of opinion on the need or desirability of setting up of a body on an all-India basis. Most of the parties consulted have stated that the setting up of local machinery would be useful, although some of the replies stress that, what is more important is to find solutions for the difficulties experienced rather than set up advisory machinery. Among those who are in favour of local committees, Scindias consider that such committees may be set up at Calcutta and Bombay to deal with matters regarding repair berths, dry dockings etc. Ship repair firms, shipowners and Port Trusts should be represented on these committees. They may work out an advance programme from time to time for providing repair berths and dry docks for ships. The committees should also be able to help shipowners in approaching import control authorities for import of spares or materials which may be required for ship repairs. Other Indian companies appear to agree generally with these proposals. The Bharat Line suggest that the Director General of Shipping should be the Chairman. The Indian National Steamship Owners' Association has suggested that such committee should be set up at all major ports for the purpose of assisting shipowners and ship repairers in obtaining import licences. The committees may further be of help in finding indigenous sources of supply for some of their requirements.

16.3. Among others consulted, Mackinnon Mackenzie consider that the committees should be fully representative of foreign and Indian shipowners. Burma Shell suggest that the committee should include shipping companies, port authorities, ship repairers and customs officials. The American Bureau considers that Classification Society surveyors should be represented on the committees. The principal ship repair firms have also favoured the setting up of local committees. The Mazagon Dock have suggested that, as urgent situations arise, the Committees should, while being of an advisory nature, speak with sufficient experience and authority so that the recommendations put forward by them would be acted upon promptly and effectively. The Scindia Workshop feel that such committees may co-ordinate the allocation of dry docks and repair berths and act as the final authority for recommending import licences. The Shalimar Works consider that the committees would be of use only if they are able to speed up grant of licences etc. and remove other hindrances to ship repair work.

16.4. Our discussions have revealed that there is need for an all-India organisation of ship repairers and ship builders for two purposes. At present there is no representative body for the ship repair industry as such, and in relation to Government, its problem are dealt with through the Engineering Associations. As the improvement and expansion of ship repair facilities are likely to be included in future Plans, we consider that it is desirable that there should be an organisation which exclusively represents this industry and which can be consulted by Government. This organisation would be able to represent to Government, with authority, matters of importance concerning the industry. The second consideration is that such an organisation can better deal with problems of interest to the industry as a whole and also problems of research, standardisation etc. This aspect is assuming importance in connection with the progressive manufacture of equipment etc. required for shipbuilding and ship repairs. We, therefore, consider that the formation of an all-India organisation of ship repairers and ship builders is necessary and desirable in the interests of the industry and that the Government should encourage the formation of such an organisation, and accord recognition to it, when formed.

16.5. Although no definite opinions were expressed regarding the setting up of an all-India advisory body, we consider that it is desirable that such a body with representatives of ship repairers, shipbuilders, shipowners, major ports and departments of Government directly concerned (*e.g.*, Director General of Shipping, Customs, Import Control, Navy, Development Wing, etc.) should be set up. We accordingly recommend the formation of such a body to deal with and advise the Government on all matters pertaining to the industry as a whole. This advisory body may be attached to the Ministry of Transport and Communications and be presided over by the Minister.

16.6. As regards local committees, we consider that, until repair facilities are improved at other major ports, there is scope for useful functioning of such committees only at Calcutta and Bombay. The committees may be presided over by the Chairman of the Port Commissioners or the Port Trust and should include the representatives of the local Customs, Import Control, Navy Development Wing and Mercantile Marine Departments and the various commercial interests concerned *viz.*, ship repairers, shipowners, and agents. They should be advisory bodies and should deal with matters concerning general improvements in repair facilities, repair berth and dry dock programmes, availabilities or shortages of ship repair materials etc. We accordingly recommend the formation of local advisory committees at the port of Calcutta and Bombay.

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CHAPTER XVII

MISCELLANEOUS MATTERS

17.1. In this chapter we shall deal with certain matters which though not directly arising from our terms of reference, nevertheless have a bearing on them.

17.2.1. **Types of repairs which are difficult to carry out in India.**—There are certain types of repairs and renewals which cannot at present be properly carried out in India. Some of these items are listed below.

17.2.2. **Tail shafts.**—If the tail shaft of a medium or large sized vessel is condemned, it cannot be replaced in India. At present only forgings of 8″ to 9″ dia and of limited length can be made in India. The proposed heavy forging and casting factory at Ranchi may be able to undertake this type of work.

17.2.3. **Tail shaft liners.**—At present there are no facilities to shrink gun metal liners on the tail shafts when they require renewal.

17.2.4. **Propellers.**—Although repairs to propeller blades are undertaken to a limited extent, replacement of large propellers or repairs to undetachable propeller blades cannot be undertaken in India.

17.2.5. **Anchors and chain cables.**—Only minor repairs can now be carried out in India. There are no facilities for testing chain cables.

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17.2.6. **Lifeboat Davits of Gravity or Luffing types.**—Only minor repairs can now be carried out in India.

17.2.7. **Main engines.**—In the case of steam reciprocating engines, almost all repairs can be carried out, except a few items such as renewal of matallic packings, piston rings etc. As regards steam turbines, reblading of rotors and castings cannot be carried out in India.

With regard to diesel engines, as is the practice abroad, repairs are carried out mostly by fitting spares which the ships often carry. The difficulty in this case is mainly with regard to the import of spares, to which we have referred earlier.

17.2.8. **Dynamic balancing of rotors.**—There are difficulties in arranging this work. It is understood that one general engineering workshop has some facilities and that the Naval Dockyard is also setting up a machine.

17.2.9. **Repairs to precision instruments.**—Most of the intricate instruments, particularly those electrically operated, cannot be satisfactorily repaired in India at present.

17.2.10. **Repairs to electrical machinery, switch gear etc.**—Difficulties are experienced in undertaking major repairs to some of these items.

17.2.11. **Aluminium lifeboats.**—There are no facilities for building or repairing welded aluminium alloy lifeboats. There is also difficulty in obtaining materials of correct specifications.

17.3. Specialised repairs.—There are fairly adequate facilities for carrying out refrigeration repairs, insulation work and laying of deck composition through authorised sub-contractors. At present Marconis have agreements with most Indian shipping companies, either for rental/maintenance or for servicing their radio equipment and they attend to all specialised repairs to the equipment. There are, however, only limited facilities for repairs to radio-navigational aids and electronic equipment.

17.4. **Diving and underwater repairs.**—There are inadequate facilities at Indian ports for carrying out minor repairs to the underwater parts of a ship while afloat. All major ports have divers who can locate damage or faults, but there is very little equipment for underwater repairs. The port of Cochin possesses welding and cutting equipment, but it has not been brought into use. If similar equipment is available at all major ports and trained personnel is available, it may be possible to carry out minor underwater repairs afloat and thereby avoid dry docking in cases in which such repairs are feasible.

17.5. **Chipping and painting.**—Traditionally chipping and painting are cheaper in India than in European ports, in spite of mechanisation of the work in the latter ports, owing to lower labour costs in this country. Upto last year the chipping and painting industry was not subject to any regulation or control and the contractors competed for the work and were free to engage such labour as they wanted on terms which were agreed to between them and the labour union concerned. Last year Government introduced the Bombay Unregistered Dock Workers Regulation of Employment Scheme. Similar schemes were notified for the ports of Calcutta and Madras also. Under the provisions of the scheme, all the employers and the chipping and painting workers were to be brought under a register and it was further provided that no employer or worker who was not on the register of the Dock Labour Board could engage in the industry in the port. This is the first step towards the regulation of work in the port so far as this section of industry is concerned. The next step would be for the Dock Labour Board to regulate wages and conditions of employment of the workers, including provision of under-employment and unemployment relief, welfare amenities etc.

The contractors have represented that the introduction of this scheme has affected the discipline of chipping and painting labour. They fear that the costs will also rise with the result that this work may be diverted from Indian ports. As this is an established industry in Indian ports, every effort should be made to retain the existing quantum of chipping and painting work. It is for consideration whether this should be done by linking the wages with output or by partial mechanisation or both.

17.6. **Facilities in Naval Dockyard.**—The Indian Naval Dockyard workshop in Bombay has facilities for certain types of work which are not available in other workshops; for instance, it has facilities for steel castings, machining medium length shafts, etc. It is also likely to acquire specialised additional equipment in future. We recommend that, to the extent the Dockyard possesses such special facilities, they should be made available to ship repair firms or shipping companies whenever they need them.

17.7. **Disposal of steel scrap.**—It has been reported to us that the procedure for disposal of scrap by ship repair firms is cumbersome. Under the existing procedure, melting scrap is required to be offered in the first instance to electric furnace owners and re-rollable scrap to recognised re-rolling mills. If furnace owners are not interested in buying melting scrap, the ship repair firms can then auction it. As regards re-rollable scrap, in case the re-rolling mills are not interested in buying it, the repairers are required to offer it to registered stockholders; the repairers are authorised to dispose of it only if none of the stockholders is interested. In all cases, the scrap is treated as an item of import by the customs authorities and the firms concerned have to obtain a custom clearance permit from the Iron and Steel Controller. All these processes entail considerable correspondence and delay and, in the meantime, the scrap accumulates so rapidly in the workshop premises that it seriously limits their storage and even working space. We recommend that the procedure should be simplified and the Iron and Steel Controller should be given authority to issue final disposal instructions without the ship repair firms having to enter into prolonged correspondence with furnace owners and/or re-rolling mills.

17.8. **Levy of customs duty in cases where duration of repairs exceeds three months.**—We were informed in Calcutta that in cases where the total duration of surveys or repairs exceeds three months, the customs authorities treat the ship as having changed from 'foreign' to 'coasting' and all the stores etc. on board as having been cleared into the country, and recover customs duty on them. Although it appears that refunds are obtained subsequently, we feel that, as occasionally delays in repairs are bound to occur, the procedure should be so modified that the formality of levying customs duty does not arise in such cases.

17.9.1. **Application of the Factories Act to the Ship repair industry.**—Two important difficulties arising from the application of the Factories Act to the ship repair industry were mentioned to us.

17.9.2. Section 58 of the Act prohibits over-lapping shifts in any factory but the State Government (or the Chief Inspector) is empowered by written order to exempt any specified factory or class or part of factories or any categories of workers from this provision. The continuity of fabrication and machinery work in ship repairs requires that the second shift in a workshop should begin sometime before the end of the first shift, so that the charge hands and the workers may take over and continue the work without interruption from the workers of the first shift. Technically such arrangements would be regarded as overlapping shifts and this industry has not been granted any exemption under the Act. Some workshops have tried to get over the difficulty by allowing only the charge hands to overlap. We would recommend to State Governments that applications from ship repair firms for exemption under the Act should by sympathetically considered as the rigorous enforcement of the Act adversely affects continuity and speed of ship repair work.

17.9.3. Section 64 of the Act seeks to restrict overtime work by factories, but power is again conferred on State Governments to grant exemptions. Under the Factories Rules, however, the only exemption granted to the ship repair firms in respect of 'urgent repairs', which has been defined as work done to machinery or plant, but only in so far as it may be necessary to avoid serious interference with the ordinary working of the undertakings. In other words, the exemption appears to be restricted to urgent maintenance requirements of the workshop itself, and does not extend to urgent repair work on ships. It has been stated that this has a serious restrictive effect on ship repair work. Working of overtime in ship repairs is unavoidable owing to various factors like shortage of certain types of skilled labour, availability or berths/drydocks etc. for limited periods, inadequacy of work for regular additional shifts etc. and the primary importance of the time factor. We understand that there are no such restrictions on this industry in foreign countries. In view of the difficult period through which the industry is now passing in this country, it is desirable to remove such restrictions. We therefore recommend that exemptions should be freely granted to ship repair firms from the operation of the above section.

17.10. **Fresh water supply to ships in ports.**—Although this subject does not strictly relate to ship repairs, we heard complaints almost in all the major ports, and particularly in Calcutta, Madras and Cochin (and also Tuticorin), that it was becoming increasingly difficult for ships to obtain their requirements of fresh water. Instances were mentioned to us in which ships had to be diverted to other ports for fresh water supplies. The nature of the difficulties appears to vary from port to port. In Calcutta the supply is controlled by the Municipal Corporation and the main bottleneck appears to be inadequacy of water barges. In Cochin the supplies are inadequate. Some of the ports have schemes for improving the supplies. We have referred to this matter in view of its importance and we suggest that the port authorities should take all possible steps to remove this difficulty. We also recommend that, where necessary, the port authorities should permit private parties to own and operate water barges within the ports for supplies to ships in stream.

17.11. **Communications between ship and shore.**—The ship repair firms have represented to us that they have been unable to get licences for operating two-way V.H.F. ('Walkie-talkie') sets for communications between ships and workshops whenever repairs are carried out in stream. As this will facilitate quick communications, we recommend that applications for such licences should be sympathetically considered by the P. & T. Department.

17.12. **Hire of port craft or equipment.**—It was mentioned to us that recently when the Bombay Port Trust was approached for a dredger for dredging the approaches to a private slipway in the port, the Port Trust demanded, in addition to the usual deposit of Rs. 10,000 taken in such cases, a further security deposit of Rs. 8 lakhs, presumably against the value of the dredger. Quite apart from the question of responsibility for dredging such approaches and channels, the imposition of such onerous conditions would make it impossible for shipping companies or ship repair firms to obtain port craft or equipment for essential requirements. The position should be reviewed and if such requirement of heavy deposits is based on any existing laws or rules, these should be suitably amended.

17.13.1. **Port charges for repair work.**—The Indian National Steamship Owners' Association has brought to our notice that recently the Bombay Port Trust have made a change in the method of charging dues on berths allotted for repairs. When applying for a berth, the shipping companies have to indicate the period for which the repair berth is required. When a berth is allotted, the ship can continue to occupy it even if the period indicated in the application is exceeded, provided it is not required for other purposes by the Port Trust. As regards charges, the Port Trust used to make a uniform charge under clause (c) of Section IV of the B.P.T. Dock Scale of Rates which reads as follows:—

> "On vessels berthed inside the docks or at the East Wall of the docks undergoing repairs not working cargo—
>
> (i) For vessels not exceeding 250′—Rs. 70 per diem.
>
> (ii) For vessels exceeding 250′ but not exceeding 400′ in length.—Rs. 125 per diem.
>
> (iii) For Vessels exceeding 400′ length—Rs. 200 per diem.

17.13.2. Under the recent change the port trust have started charging dues under clause (d) of Section IV for the period in excess of the period initially applied for . This clause provides that vessels undergoing repairs, or otherwise preventing the usual working use of any berth inside the docks or at the harbour wall, may be required to pay special charges, in addition to the repairing rates, at such rates as the Docks Manager may decide upto Rs. 500 per day or part of a day. In cases in which the continued occupation of the berth is prolonged, the Port Trust Board may levy a charge which may extend to Rs. 1,250 per day or part of a day. The Indian National Steamship Owners Association has contended that the levy of rates under clause (d) referred to above would act harshly on the shipowners and they might divert their ships elsewhere for carrying out repairs. On the other hand, the Port Trust has indicated to us that the levy of the special rates is permissible under existing rules and that they have had to enforce them because of several cases of prolonged occupation of berths by ships undergoing repairs in excess of the originally indicated periods.

17.13. 3. Compared to the normal charges of Rs. 125 per day and Rs. 200 per day for medium and large vessels respectively, the levy of special charges of Rs. 500 and Rs. 1,250 per day appears to be excessive and has also the appearance of a penal levy. Such a levy is likely to discourage the use of the port berths for repairs and in any case it will ultimately be reflected in the cost of repairs.

17.13.4. A reasonable schedule of charges for the use of fully equipped repair berths will eventually have to be worked out in consultation with the interests concerned. It is our view that, in the meantime, the port authorities would do well not to collect extra charges under clause (d) except in extreme cases.

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CHAPTER XVIII

SUMMARY OF RECOMMENDATIONS

Serial No.		Para.
	General	
1	Government and the port authorities should accept the principle that it is part of their responsibility to provide for the requirements of the ship repair industry and Government should clarify their policy in this matter accordingly	9.11
2	Subject to the implementation of the recommendations made by us regarding port dry docks in Calcutta and Bombay, there is no need to consider the provision of additional dry docks for merchant ships in these ports at present	11.6.2
3	In order to make the industry more broad based, the new dry docks should preferably be constructed in Visakhapatnam and Cochin rather than in Calcutta and Bombay	11.6.2
4	The provision of twelve fully equipped repair berths for both Calcutta and Bombay should be accepted as the ultimate target	12.3.3
5	In the ports of Visakhapatnam, Madras and Cochin one of the new berths should be equipped as a repair berth and allotted for repairs whenever required .	12.7
6	The port authorities should provide all essential facilities like cranes, electric power, compressed air, water supply etc. at the dry docks controlled by them and also at the berths earmarked for ship repairs	..
7	Government should encourage the privately owned workshops to undertake modernisation of their workshops, if necessary, with a scheme of financial assistance on favourable terms . . .	10.4
8	The private workshops should be encouraged to develop facilities for various items of repair work which cannot at present to be carried out in India with such assistance as may be required from Government	10.5

Serial No.		Para.
9	The Indian Naval Dockyard should make available its dry docks for merchant ships whenever they require them for routine dry docking etc. to the extent their own work permits	11.11
10	To the extent the I.N. Dockyard Workshop has facilities for special types of work, they should be made available to ship repair firms or shipping companies whenever they need them	17.6
11	The facilities of the port workshops at Visakhapatnam, Madras, Cochin and Kandla should as a matter of policy be made available to merchant ships requiring repairs	10.2
12	The Hindustan Shipyard should, as a matter of policy, extend its activities to ship repair work and take early steps to fully equip itself for this purpose .	10.3
13	The formation of an all-India organisation of ship repairers and shipbuilders is necessary and desirable and the Government should encourage the formation of such an organisation and accord recognition to it, when formed	16.4
14	It is desirable to set up an all-India advisory body with representatives of ship repairers, shipbuilders, shipowners, major ports and the departments of Government concerned. This body should advise Government on all matters pertaining to the industry as a whole. This body may be attached to the Ministry of Transport and Communications and be presided over by the Minister . . .	16.5
15	Until repair facilities are improved at other major ports, there is scope for local advisory committees only at Calcutta and Bombay. These may be presided over by the Chairman of the Port Commissioners or Port Trust and should include the representatives of the Government departments and the commercial interests concerned. These committees should deal with matters concerning improvements in repair facilities, repair berth and dry dock programmes, shortage of materials etc. . . .	16.6

MAJOR PORTS

CALCUTTA

Serial No.		Para.
16	The six large port craft may continue to use the larger dry docks (*i.e.*, K.G. dry docks and K.P. dry docks Nos. 1 and 2) for their requirements. When these craft require the use of the dry dock for long periods, they may preferably be docked in K.G. dry dock No. 1	11.5.4

Serial No.		PARA
17	All other craft should, as far as possible, be docked on the port slipways, the Island Workshop dry docks and Kidderpore dry dock No. 3 and they may use the larger dry docks only when it is unavoidable	11.5.4
18	When the port vessels are docked in the larger dry docks, the port authorities should arrange for work to be done round the clock so that it is completed in the shortest possible time . . .	Do.
19	A heavy lift crane in the K.G. drydocks and additional compressors and flood lighting in both the K.G. and K.P. dry docks should be provided within the remaining period of the Second Plan . . .	11.8.1
20	Improved compressed air supply, A.C. and D.C. power, drinking water facilities, sanitary arrangements and telephone facilities, as recommended by us at both the K.G. and K.P. dry docks should also be provided within the remaining period of the Second Plan	11.8.3. & 11.8.4
21	The Kidderpore dry docks should be renovated and a 15-ton travelling crane provided during the Third Plan period	11.8.5
22	The three lay up berths in K.P. Dock (off 28 and 29) and K.G. Dock (G. berth) should be earmarked for ship repairs, dredged to a minimum depth of 18′ and equipped with certain essential facilities as recommended by us during the remaining period of the Second Plan	12.5.1
23	Provision for certain additional facilities like travelling cranes, compressed air, etc. at these berths should be made in the Third Plan . . .	12.5.2
24	During the Third Plan period, the 'H' berths in the K.G. Dock should be adapted and equipped as a repair berth. In addition, two berths in the new basin proposed to be built in the K.G. Dock should be constructed as repair berths as a part of that plan	12.5.3

BOMBAY

Serial No.		PARA
25	As some thirty port craft will in future be of such draft and dimensions that they cannot be docked on the port slipways, the Port Trust should construct a small dry dock near the port workship large enough to take all such craft	11.5.6

Serial No.		PARA.
26	Thereafter all port craft should, as far as possible, be docked in this dry dock or the port slipways and they may use the larger dry docks only when it is unavoidable.	11.5.6
27	Pending the construction of the new dry dock, whenever the port craft use the larger dry docks, the port authorities should arrange for the work to be done round the clock, so that it is completed in the shortest possible time	Do.
28	The proposal to lengthen the Hughes dry dock by 125′ so as to make two T.2 tankers should be considered and taken up for execution as early as possible and completed early in the Third Plan period	11.9.11
29	Improved compressed air supply, A.C., and D.C. power, drinking and salt water supplies, sanitary arrangements and telephone facilities, as recommended by us, at both the Hughes and Mereweather dry docks should be provided within the remaining period of the Second Plan	11.9.2, 11.9.3 & 11.9.4
30	A reservoir of suitable size for storage of fresh water should be constructed near the Hughes dry dock	Do.
31	A 15-ton travelling crane should be provided solely for the use of the Mereweather dry dock	Do.
32	The Port Trust and the Mazagon Dock should co-operate to achieve increased utilisation of the Ritchie and Mogul dry docks which are controlled by the Mazagon Dock. The Port Trust should be prepared to accept responsibility for dredging and maintenance of the channel and the approaches to these dry docks and the Mazagon Dock, on their part, should be agreeable to incur capital expenditure on lengthening and deepening the Ritchie dry dock, which would make it suitable for docking large merchant ships. They should also not be averse to hiring out the Mogul dry dock to shipping companies who wish to utilise the services of the ship repair firms other than the Mazagon Dock	11.10
33	The inner northern half of K.L.M. berths and the northern half of N and O berths in the Prince's Dock should be reserved for ships needing repairs	12.6.2
34	No. 9 berth in the Victoria Dock should also be earmarked for ship repairs	12.6.3

Serial No.		PARA
35	All the above berths should be equipped with the various facilities, as mentioned in the case of Calcutta, during the remaining period of the Second Plan and in the Third Plan period . . .	12.6.4
36	In addition to the above, one berth in the outer dock wall should be made available as a repair berth during fair weather. It should be dredged to maintain a minimum depth of 18′ and equipped with necessary facilities	12.6.5
37	The Kassara Basin should be put into use as a repair basin for medium sized vessels. This will necessitate dredging of the basin and the approach channel, fitting of a lock gate, strengthening of the piers and providing various repair facilities. This should be included in the Third Plan . . .	12.6.6
38	In any scheme for construction of new basins or docks in Bombay, two fully equipped berths for repair purposes should be planned as part of the scheme .	12.6.7

VISAKHAPATNAM

Serial No.		PARA
39	The scheme under consideration by the Hindustan Shipyard for the construction of a dry dock should be taken up at an early date. The dry dock should be capable of accommodating T.2 type tankers. The proposal of the port authorities for lengthening and deepening their dry dock should be considered in the light of the above . . .	11.12

KANDLA

Serial No.		PARA
40	There is no need to consider the provision of a separate repair berth at this port at present . .	12.7

MADRAS

Serial No.		PARA
41	It is not necessary to consider the provision of a dry dock at this port at present . . .	11.13
42	The use of the port slipway for docking small seagoing vessels based on this port should be permitted .	11.13

COCHIN

Serial No.		PARA
43	The construction of a fully equipped dry dock, either as a part of the second shipyard scheme or otherwise, should be planned and completed by the end of the Third Plan period	11.14

Serial No.		Para
	MINOR PORTS	
44	There is scope for improving the existing facilities at the ports mentioned below to serve the needs of small coastal vessels for dry docking and repairs and also of deep sea ships for repairs afloat . .	13.1
	MANDAPAM	
45	The dry dock should be lenghthened and deepened so as to dock vessels of 350′ length and 15′ draft and the approach channel dredged during the Third Plan period	13.2.2
46	The slipway should be brought into use for docking and repairs to small vessels and craft plying in the area	Do.
47	The workshop should, as a matter of policy, undertake repairs to privately owned vessels	Do.
	TUTICORIN	
48	The provision of a ship repair workshop and a fully equipped repair berth at this port should be considered as part of the general plan for development of Tutricorin as a major port	13.3.2
	BHAVNAGAR	
49	The existing dry dock should be extended and deepened so as to dock vessels of 350′ length, 45′ breadth and 15′ draft	13.5.2
50	The port workshop should, as a matter of policy, undertake repairs to privately owned vessels and the workshop should be expanded for this purpose .	Do.
51	In the new port one of the new berths proposed to be built should be earmarked for ship repair work and fully equipped with all repair facilities . .	13.5.3
	OKHA	
52	The workshop at this port should be equipped for carrying out maintenance and running repairs to merchant ships	13.6.2
	BEDIBUNDER	
53	The dry dock at this port should be renovated and the lock gates repaired	13.7

Serial No.	VERAVAL	Para.
54	The dry dock may be used in future for docking small vessels and sailing vessels which are being mechanised	13.8

SHIP REPAIR MATERIALS AND SHIP STORES

55	While a policy of progressive manufacture of these items indigenously should be pursued, it is necessary to take a liberal view of applications for import of materials if the industry is to be in a state of competitive efficiency	14.3.7
56	High priority should continue to be given to the steel requirements of the ship repair industry and steps taken to eliminate avoidable procedural delays. Quota certificates should be issued before the end of the quarter to which they relate	14.6.2
57	The Iron and Steel Controller should make every possible effort to fulfil the quotas allotted to ship repair firms both in terms of total tonnage and also of the specified categories applied for. To the extent the quotas cannot be fulfilled from indigenous producers or stockists the repair firms concerned should be enabled to obtain the balance from abroad by issue of necessary import licences	14.6.3
58	To meet emergency requirements of shipping companies and small ship repair firms not registered with the Development Wing, the Iron and Steel Controller should, on the recommendation of the Director General of Shipping, make ad hoc supply available to them without delay from the producers or stockists	14.6.4
59	The entire position regarding supply of steel should be reviewed after the three Government steel plants have been in production for some time in consultation with the all-India Advisory Body recommended by us	14.7
60	Imports of required quantities of Oregon pine and Lignum Vitae should be allowed until regular supplies of indigenous substitutes are available	14.8
61	In the case of certain materials essential for ship repairs, workshop spares and equipment should have the same preferential treatment as raw materials have for other industries	14.10.1
62	In view of the special position of the industry its imports requirements should be dealt with separately from those of other industries importers and provision made to meet them directly	14.14.1

Serial No.		Para.
63	A separate foreign exchange quota should be established for the ship repair industry for import of materials required for ship repairs and workshop spares and equipment. It may be administered by the Development Wing and a liberal licensing policy should be followed in respect of their imports subject to proved non-availability from indigenous sources. All policy questions regarding this quota should be dealt with in consultation with the all-India Advisory Body recommended by us . .	14.14.2
64	A special foreign exchange quota should be established fot import of spares, ship stores etc. required by shipping companies. This quota may be administered by the Directorate General of Shipping. All policy questions regarding this quota should be dealt with in consultation with the Indian National Steamship Owners' Association	14.14.3
65	The decisions of the Development Wing and the Directorate General of Shipping as to the necessity for imports should be accepted by the Import Control Authority for issue of licences . . .	14.14.4
66	A more liberal policy in regard to imports of essential ship stores by ship chandlers should be followed .	14.14.5

CUSTOMS PROCEDURE

Serial No.		Para.
67	The present customs procedure does not take account of the special requirements of the ship repair industry, and affects it adversely. The entire policy should be reviewed and necessary changes made in the procedure	15.12
68	The present machinery pass system results in increasing the time of ship repairs in Calcutta and Bombay owing to delays in complying with the procedure. A new procedure should be evolved, which should be simple in operation and remove the factors which result in delays.	15.13
69	As regards the changes to be made, the Master or Chief Engineer of a ship and the supervisor of the repair firm should be authorised to sign the machinery pass. It should be endorsed by the customs officer at the gate after necessary check. To protect Government's interests an over-riding guarantee should be furnished by the shipowners or the agent and the ship repairer accepting responsibility for the actions of their officers	15.14
70	One or two gates in each dock in Calcutta and Bombay may be specified through which all lorries carrying	

Serial No.		Para.
	repair materials should pass both outward and inward	15.14
71	Pending revision of the procedure as suggested above, urgent steps should be taken to make available in these two ports an adequate pool of customs officers, both during and outside working hours. The customs staff handling this work should be strengthened and all customs inspectors available in the dock concerned should be authorised to deal with all matters connected with machinery passes. Special officers with telephone facilities should be earmarked to deal with machinery passes outside working hours	15.16 & 15.17
72	Although difficulties are experienced in other ports also as a result of the machinery pass system, they will be overcome by the general procedural changes recommended by us	15.18
73	The shipment of spares, materials etc. for repairs should be treated differently from ship stores and they should be allowed to be shipped freely subject to such formal documentation as may be prescribed for record purposes. A responsible officer of the shipowner, agent or ship repairer may be required to certify the items which are proposed to be shipped	15-19
74	No restrictions should be imposed on the fitting of new parts on ships undergoing repairs by transfer of parts from another ship of the same owner or from bond or by import from abroad	15.20
75	Shipowners and ship repairers should be allowed to avail themselves of bonding facilities on a liberal scale and at a reasonable cost	15.20

MISCELLANEOUS

Serial No.		Para.
76	Two sludge barges of approximately 100 tons should be provided in Calcutta and Bombay for discharge of sludge. Shore sludge tanks should also be provided for discharge of sludge from the barges	12.8
77	Space should be made available to the principal repair firms at the major ports in the dock area for maintaining a small workshop-cum-office. Facilities should be given to use a part of the premises for a small bonded store	12.9
78	Garbage bins should be provided near the dry docks and the repair berths to collect waste materials from ships	12.10

Serial No.		Para
79	Every effort should be made to retain the existing quantum of chipping and painting work in Indian ports by suitable measures	17.5
80	The procedure for disposal of scrap should be simplified and the Iron and Steel Controller should be given authority to issue final disposal instructions without the ship repair firms having to enter into prolonged correspondence with furnace owners and/or re-rolling mills	17.7
81	The procedure should be so modified that the existing formality of levying customs duty on ship stores etc., when repairs exceed three months, does not arise	17.8
82	State Governments should consider sympathetically applications from ship repair firms for exemption from section 58 of the Factories Act relating to overlapping shifts and Section 64 relating to overtime work	17.9.2
83	The port authorities should take steps to improve fresh water supplies for ships' requirements where necessary. The port authorities should also permit private parties to own and operate water barges within the ports for supplies to ships in stream	17.10
84	Applications from ship repairers for operating two-way V.H.F. Sets between ships and workshops should be sympathetically considered by the P. and T. Department	17.11
85	The terms on which port craft or equipment are hired to ship repairers should be reviewed so as to eliminate any onerous conditions which would restrict their use or availability	17.12
86	In cases of prolonged occupation of berths for repairs the Bombay Port Trust should discontinue levying extra charges under clause (d) of Section IV of the B.P.T. dock scale of rates, except in extreme cases	17.13.4
87	It would be of assistance in future if the port authorities and shipping companies keep certain essential information regarding dry docks, berths, time and expenditure on ship repairs, etc.	2.9

(Sd.) O.V. ALAGESAN, Chairman.

(Sd.) AMARNATH AGARWAL, M.P.

(Sd.) NARENDRA P. NATHWANI, M.P.

(Sd.) Rear Admiral T.B. BOSE, I.N.
(Sd.) Captain T.N. KOCHHAR, I.N.
(Sd.) H.C. RAUT.
(Sd.) P.N. RABADY.
(Sd.) T.M. SANGHAVI.
(Sd.) F.V. BADAMI.
(Sd.) H.M. TRIVEDI. Secretary.
(Sd.) P.R. SUBRAMANIAN, Secretary.

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ANNEXURES

No.	Reference in the main Report		Title	Page No.
	Page No.	Para No.		
I	3	1·5	Copies of the Questionnaires issued to various authorities	
II	3 & 30	1·5 6·2	List of persons or organisations who replied to the questionnaires	
III	4	1·7	Ship repair and other workshops visited	
IV	4	1·7	List of persons who gave oral evidence	
V(A)	66	10·2	Facilities available in workshops of major port administrations	
V(B)	7	2·7	Facilities available in workshops of selected minor port administrations	
V(C)	43	7·21	Facilities available with workshops of private ship repairers in Calcutta	
V(D)	43	7·21	Facilities available in workshops of private ship repairers at Madras, Cochin and Bombay	
VI	7 44	2·7 8·1	Particulars of floating cranes, water barges, drydocks & repair berths available at all ports	
VII	43	7·21	List of Sub-contractors	
VIII	32	6·7	Statements showing names of Indian shipping companies and particulars of their fleets	
IX	94	13·5(4)	Showing names, etc., of firms registered with the Development Wing for allotment of steel quotas	

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ANNEXURE I

GOVERNMENT OF INDIA

SHIP REPAIRS COMMITTEE

Questionnaire to Port Authorities

Question No.

1 How many floating cranes and water barges are available in your port under your control —

Please give full particulars.

2 How many drydocks are there under your control ?

Please give full details, *i.e.*, length, breadth, maximum arrival draft of ship etc.

3 For the years 1955, 1956 and 1957, please indicate how many days each drydock was vacant due to (a) lack of demand (b) repairs or maintenance of drydock machinery and equipment.

4 How many days in each of the above years was each drydock utilised solely for Port Trust purposes ?

5 What prior notice is required for booking drydocks and what is the maximum number of days for which a drydock can be made available at a time ? Is there any system of priorities ?

6 Please furnish a statement containing the following information in respect of the drydocks under your control for the years 1956 and 1957 :—

(*a*) Name of each vessel for which drydock was applied for (*b*) Period applied for (*c*) Date on which vessel was Ready to dock (*d*) Date on which vessel entered drydock (*e*) No. of days in drydock.

7 Do you consider any increase in the drydock facilities at your port necessary? Have you any plans for increasing the number of drydocks : If so, please give particulars.

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8 Do you have any separate repair berths and, if so, how many large vessels undergoing major surveys, repairs or overhauls, can be berthed at a time.

9 Are the following facilities available at the drydocks and repair berths-(*a*) Water (*b*) Electric supply (*c*) Compressed air (*d*) Cranes (*e*) Fire fighting equipment.

10 Have you received any complaints about availability of drydock and/or repair berth facilities, and , if so, what is the nature of the difficulties complained of ?

11 Do you consider that Governmental control over ship repair facilities will lead to an improvement in the existing conditions : if so, what is the type of control which you suggest ?

GOVERNMENT OF INDIA

SHIP REPAIRS COMMITTEE

Questionnaire to Shipowners

Question No.

1 Please indicate the number of ships owned by you distinguishing between (*a*) passenger ships and (*b*) other ships, indicating their gross tonnages.

2 How many of these ships are employed in (*a*) the coasting trade and (*b*) foreign-going trades ?

3 Do you own a repair workshop of your own; if so, where ?

4 (*a*) At what ports are arrangements for the following items for the ships of your Company made (*a*) passenger surveys (*b*) load line surveys (*c*) classification surveys (*d*) periodic drydocking and (*e*) other major repairs and overhauls.

(*b*) Please furnish the approximate figures of expenditure on above at each port for the years 1955, 1956 and 1957.

5 What is the expenditure on voyage or running repairs carried out in different ports during the last 3 years?

NOTE.— In respect of items (4) and (5), please furnish information both in respect of repairs carried out in Indian ports and foreign ports, as far as possible under the following heads— (*a*) Plating and sheet metal work (*b*) Plumbing work (*c*) Carpentry and joinery work (*d*) Electric work (*e*) Main and auxiliary machinery repairs (*f*) Cleaning, chipping and painting work (*g*) Boilers repairs (*h*) Repairs to Radio and Radio navigational aids (*i*) Refrigeration repairs (j) Insulation work.

6 Which are the ship repairing firms at various parts to which the repairs of the above categories are entrusted ?

7 Please indicate in detail the nature of the difficulties experienced in arranging or carrying out repairs at different Indian ports. The replies may be given under the following suggested headings— (*a*) Prior arrangements before arrival of ship (*b*) Time factor (*c*) Availability of materials and spares (*d*) Availability of drydock and repair berths (*e*) Availability of dockside facilities like fire fighting, fresh water, power crane, compressed air etc. (*f*) Customs and Port regulations. Please mentioned specific major instances, if possible which indicate the nature and seriousness of the difficulties.

8 How does the level of costs of repairs in India compare with those of foreign countries ? If the costs are higher than elsewhere, can you indicate any special reasons and suggstions for improvement ?

9 What arrangements do you make for special items of repairs such as repairs to Lifeboats, Radio and Radio-navigational aids, Refrigeration, Insulation etc. ?

10 On how many occasions did you require a drydock or repair berth and how many days were lost due to waiting for (*a*) drydocks (*b*) repair berths, at different Indian ports during the years 1955, 1956 and 1957 ?

11 What is the anticipated expansion of the fleets of your Company in the next 5 years/10 years ; if possible, please indicate the type and tonnage of the ships proposed to be acquired.

12 Do you consider whether the setting up of any Advisory or Consultative Body Central or local, to deal with matters relating to ship repairs and dry-docking, would serve any useful purpose and assist the Shipping Companies : If so, what is the type of organisation you suggest?

13 Do you consider that Governmental control over ship repair facilities will lead to an improvement in the existing conditions: if so, what is the type of control which you suggest?

14 What specific suggestions do you have for improvement of the dry-docking and repair facilities at various ports ?

Questionnaire to Foreign Shipping Agents

Question No.

1 What is the number of calls made by the ships of your principals at Indian ports during the year 1957? What is the normal duration of their stay at such ports?

Please furnish this information separately in respect of the different lines which you represent.

2 Do you make arrangements in Indian ports in respect of your principals' ship for (*i*) survey repairs or (*ii*) voyage or running repairs ?

Please furnish approximate figures of expenditure on such repairs at each port for the years 1955, 56 and 57.

3 Which were the ship repairing firms in each port which carried out the Work ?

4 Please indicate in detail the nature of the difficulties, if any, experienced in arranging or carrying out repairs at different Indian ports. The replies may be given under the following suggested headings—(*a*) Prior arrangements before arrival of ship (*b*) Time factor (*c*) Availability of materials and spares (*d*) Availability of dry-dock and repair berths (*e*) Availability of dockside facilities like fire fighting, fresh water, power, crane, compressed air etc., (*f*) Customs and Port regulations.

Please mention specific major instances if possible which indicate the nature and seriousness of the difficulties.

5 What is the increase visualised in the number of ships under your agency calling at Indian ports in the next five years ; If possible, please indicate the size and tonnage of the ships. ?

6 On how many occasions did you require a drydock or repair berth and how many days were lost due to waiting for (*a*) drydocks (*b*) repair berths, at different Indian ports during the years 1955-56 and 57 ?

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7 Do you consider whether the setting-up of any Advisory or Consultative Body Central or local, to deal with matters relaing to ship repairs and dry-docking would serve any useful purpose and assist the Shipping Companies ; if so, what is the type of organisation you suggest ?

8 Do you consider that Governmental control over ship repair facilities will lead to an improvement in the existing conditions ; if so, what is the type of control which you suggest?

9 What specific suggestions do you have for improvement of the dry-docking and repair facilities at various ports?

GOVERNMENT OF INDIA

SHIP REPAIRS COMMITTEE

Questionnaire to Ship Repairing Firms

Question No.

1 Do you have any repair berths under your control ; if so, please indicate length of the berths and maximum permissible draught of vessels which can be berthed ?

2 (*a*) Do you have any drydocks under your control : If so, give full details, *i.e.*, length, breadth and maximum arrival draft ?

(*b*) Do you have a drydock licence?

3 Do you have any slipways : if so, please give full particulars ?

4 Do you have a drawing office : if so, please give particulars ?

5 What facilities in respect of the following items are available at the repair berth drydocks and slipways under your control—(*a*) fresh water (*b*) power supply (*c*) cranage (*d*) compressed air and (*e*) fire fighting appliances. Please give full particulars.

6 What is the approximate financial turnover of your ship repairs work during the years 1955, 1956 and 1957? What proportion of this turnover, if any, was on sub-contract?

7 How many ships under (*a*) periodic or annual surveys and (*b*) running repairs, can you handle at a time and spread over a year?

8 Can you undertake all the types of jobs mentioned below ? If not which are the items you cannot—(*a*) Plating and sheet metal work (*b*) Plumbing work (*c*) Carpentry and joinery work (*d*) Electrical work (*e*) Main and auxiliary machinery repairs (*f*) Cleaning, chipping and painting work (*g*) Boiler repair (*h*) Repairs to radio and radio-navigational aids (*i*) Refrigeration repairs (j) Insulation work and (*k*) furnishing.

If any of the above items are entrusted to sub-contractors, please give the names and addresses of such sub-contractors.

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9 Do you work in single shift, double shift or triple shifts—(*a*) in shop (*b*) on ships ? Do you work on Sundays and holidays—(*a*) in shop (b) on ships ?

10 What is the total strength of your staff divided into the following categories (*i*) superior technical personnel (*ii*) supervisory personnel (*iii*) skilled, semi-skilled and unskilled labour. What proportion of each category in above is permanent and what proportion is casual ?

11 Is there a shortage of skilled labour of any category in your Workshop : if so, give particulars.

12 What is the approximate workshop facility available *i.e.*, how many of the following types of machines do you have in your Workshop ?

(*a*) Lathes

(*i*) Centre lathes.
(*ii*) Capstan lathes.
(*iii*) Turret lathes.

(*b*) Milling machines.
(*c*) Shaping machines.
(*d*) Planning machines.
(*e*) Cutting machines.
(*f*) Welding plants.
(*g*) Air Compressors.
(*h*) Wood working machines.

ANNEXURE II

LIST OF PERSONS OR ORGANIZATIONS WHO REPLIED TO THE QUESTIONNAIRES

(1) *Indian Shipping Companies and Indian National Steamship Owners' Association.*

1. Indian National Steamship Owners' Association, Bombay.
2. The Scindia Steam Navigation Company Ltd., Bombay.
3. The India Steamship Company Limited, Calcutta.
4. The Great Eastern Shipping Company, Limited, Bombay.
5. The Eastern Shipping Corporation Limited, Bombay.
6. The Malabar Steamship Company Limited, Bombay.
7. The Bombay Steam Navigation Company (1953) Private Ltd. Bombay.
8. The Hindustan Shipping Company, Limited, Calcutta.
9. The Bengal Assam Steamship Company, Limited, Calcutta.
10. Tankers Private Limited, Bombay.
11. Great India Steam Navigation Company, Ltd., Calcutta.
12. The Bharat Line Limited, Calcutta.

(2) *Agents of Foreign Shipping Companies at Ports in India.*

CALCUTTA

1. British India Steam Nav. Company Ltd .
2. Mackinnon Mackenzie & Company, Private Ltd.
3. F.W. Heilgers & Company, Private Ltd.
4. Anderson Wright Ltd.
5. Hoare Miller & Company, Ltd.
6. Harrison Line.
7. James Finalay & Company, Ltd.
8. Ameriacan Export Lines Inc.
9. Clegg, Cruickshask & Company Private, Ltd.
10. Asiatic Steam Navigation Company, Ltd.
11. United liner Agencies of India (Private) Limited.
12. Gladstone Lyall & Company, Ltd.
13. Turner Morrison & Company Private Ltd.
14. Brocklebank's Calcutta Agency
15. Java Bengal Line.
16. Indian National Steamship Company,Ltd.
17. Indo-China Steam Naviagation Company, Ltd.

VISAKHAPATNAM

1. Ripley & Company (Private) Ltd.
2. D.S. Narayana & Company.
3. Best & Company Private Ltd.
4. Gordon, Woodroffee & Company (Madras) Private Ltd.
5. James Finlay & Company, Ltd.

Madras

1. Shaw Wallace & Company Ltd.
2. The Bombay Company Ltd.
3. Messers Wilson & Company Private Ltd.
4. Gordon, Woodrofee & Company (Madras) Private Ltd.
5. Parry & Company,Ltd.
6. Compagnie Des Messageries Maritimes.
7. Volkart Brothers
8. K.P.V. Shaik Mahomed Rowther & Company.
9. D.B. Madon & Company.

Cochin

1. Prince Line Limited.
2. Volkart Brothers.
3. Darragh Smail & Company, Ltd.
4. Peirce Leslie & Company, Ltd.
5. A.V. Thomas & Company, Ltd.

Bombay

1. Lloyd Triestino.
2. Shaw Wallace Company, Ltd.
3. Burmah Shell Oil Storage & Distributing Co. of India (as Tanler agents.))
4. Volkart Brothers.
5. Caltex (India) Limited.
6. The Great Eastern Shipping Company, Ltd. (as Agents).
7. James Mackintosh & Company (Private) Ltd.
8. Mackinnon Mackenzie & Co. (Private) Ltd.
9. B.P. (India) Limited.
10. Polish Ocean Lines.
11. Turner Morrison & Company (Private) Ltd.
12. Ellerman Lines, Bombay.
13. Forbes Forbes Campbell & Company (Private) Ltd.
14. Anchor Line Limited.

(3) *Ship Repairers.*

CALCUTTA

1. The Hooghly Docking & Engineering Co. Ltd.
2. Port Engineering Works, Limited.
3. The Shalimar Works Private Limited.
4. The People's Engineering & Motor Works Ltd.
5. The India General Navigation & Railway Company, Limited.
6. Ship Repairers Private Limited.
7. Ching Wah & Company.
8. India Marine Service (Private) Limited.
9. The East Bengal Engineering Works.
10. Eastern Company Private Limited.
11. Cleghorn & Company.
12. Garden Reach Workshops Private Limited.
13. Clehack Baot Company.
14. Port Commissioners' Workshops.

VISAKHAPATNAM

1. Port Workshop.
2. Hindustan Shipyard Private Limited.

MADRAS

1. Binny's Engineerig Works (Private) Limited.
2. Harbour Engineering Private Limited.
3. Port Trust Workshop.

COCHIN

1. Brunton & Company, Engineers Limited.
2. Port Workshop.

BOMBAY

1. Mazagon Dock Private Limited.
2. Scindia Workshop Private Limited.
3. Alcock, Ashdown & Company , Limited.
4. Naval Dockyard.
5. Port Trust Workshop.
6. Modern Mechnaical & Marine Works.
7. Nirmal Ship Repair Works.
8. AFCO Private Limited.
9. Chinese Engineering Works.
10. Melet Welding Works.
11. Sunlife Engineering Works.

(4). *Major Port Authorities.*

1. Calcutta.
2. Visakhapatnam.
3. Madras.
4. Cochin.
5. Bombay.
6. Kandla.

(5). *STATE GOVERNMENTS RE: (MINOR PORTS)*

1. Government of West Bengal.
2. Government of Orissa.
3. Government of Andhra Pradesh.
4. Government of Madras.
5. Government of Kerala.
6. Government of Mysore.
7. Government of Bombay.

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SURVEYORS GOVERNMENT AND CLASSIFICATION SOCIETIES:

(6) *The Principal Officers (Mercantile Marine Department) Government of India, Calcutta Madras and Bombay.*

1. Surveyor to Lloyds Register of Shipping Calcutta-Bombay.
2. Bureau Veritas Agency— Calcutta.
3. Surveyors to Bureau Veritas and Det Norske Veritas— F.E. Hardcastle & Company Private Limited, Bombay.
4. American Bureau of Shipping— Bombay.

(7) *FOREIGN CONSULAR OFFICES:*

1. Commissioner for India— Hongkong re: Hongkong.
2. Embassy of India— Holland— re·Rotterdam.
3. Embassy of India— Belgium,— re: Antwerp.
4. The High Commissioner for India— U.K.— re:Liverpool, Falmouth.
5. The Commission for India— Sirgapore— re: Singapore.

(8) *SHIP CHANDLERS*
CALCUTTA.

1. K.C. Dutta & Sons.
2. India Marine Service (Private) Limited.
3. Don Watson & Company (Private) Limited.

MADRAS

1. K.B.S. Manian & Brothers.

BOMBAY

1. Amiruddin Shealebhoy Tyebjee & Sons.
2. Hardcastle Waud & Company (Private) Limited.
3. Ahmed S. Mooloobhoy & Sons.
4. Adamji Kadderbhoy.

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ANNEXURE III

SHIP REPAIR & OTHER WORKSHOPS VISITED

1. CALCUTTA

Garden Reach Workshops Limited.
Ship Repairers (Private) Limited.
Hooghly Docking & Engineering Company, Ltd.
Shalimar Works (Private) Limited.
Workshops of the Port of Calcutta.
India General Navigation & Railway Co. Ltd.
Ching Wah Works.

2. VIZAGAPATAM

Hindustan Shipyard Private Limited.
Workshops of the Port.

3. MADRAS

Binny's Engineering Works Limited.
Workshops of the Port.

4. MANDAPAM

Marine Workshop.

5. COCHIN

Brunton & Company Engineers Ltd.
Workshops of the Port.

6. BOMBAY

Mazagon Dock Private Limited.
Scindia Workshop Private Limited.
Alock Ashdown & Company, Limited.
Naval Dockyard.
Modern Marine & Mechanical Works.
AFCO Ship Building Works.
Shaparia Docking & Ehgineering Company, Ltd.
Nirmal Ship Repair Works.

7. SAURASHTRA

Port Workshops Bedi Bunder
,, ,, Okha
,, ,, Bhavnagar
,, ,, Veraval.

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8. KANDLA

Workshop of the Port.

ANNEXURE IV

LIST OF PERSONS WHO GAVE ORAL EVIDENCE BEFORE THE COMMITTEE

CALCUTTA

Port Administration:

Shri R. K. Mitra, I.C.S. Chairman—Commissioners for the Port of Calcutta.
Shri S. K. Mitra—Chief Mechanical Engineer for the Port of Calcutta.
Commndr. C. J. Mohan—Deputy Conservator for the Port of Calcutta.
Shri T. M. Malkani—Chief Engineer for the Port of Calcutta.
Shri S. K. Paul—Engineer Superintendent for the Port of Calcutta.
Shri S. C. Dass—Controller of Stores for the Port of Calcutta.

Principal Officers—Mercantile Marine Department:

Shri B. K. Gupta—Principal Officer.
Shri A. Krishnan—Senior Engineer & Ship Surveyor.
Shri V. V. Javdekar—Mercantile Marine Department.
Shri P. K. Banerji—Mercantile Marine Department.
Shri B. D. Kataria—Mercantile Marine Department.
Shri V. R. Kagalwala—Mercantile Marine Department.
Shri B. S. Makhija—Mercantile Marine Department.

Surveyor to Classification Societies:

Shri A. V. Fisher—Surveyor Lardner North.
Shri J. T. Rapley—Surveyor Bureau Veritas.
Shri S. J. Choksy—Surveyor Bureau Veritas.
Shri B. Hill—Surveyor Lloyds Register of Shipping.
Shri H. Allen ,, ,, ,, ,,

Indian Shipping Companies.

Shri H.M. Jagtiani—Manager, India Steamship Co., Ltd.
Shri C. Tye—Engineer Superintendent, India ,, ,,
Shri R. J. Ward,—India Steamship Co. Ltd.
Shri J. C. Anand, Marine Superintendent, Scindia Steam Navigation Co. Ltd.
Shri V. K. Katre—Engineer Superintendent, Scindia Steam Navigation Co. Ltd.
Shri D. H. C. Storey, Eng. Superintendent, Great Eastern Shipping Co. Ltd.
Shri A. G. Kamdar
Shri N. P. Mehta
Shri A. N. Shah } The Bharat Line Ltd.
Shri A. C. Sen

Ship Repair Workshops :

Shri R. B. Bone—General Manager, Garden Reach Workshops Ltd.
Shri H. J. Macfadyen—Manager, Hooghly Docking & Eng. Co. Ltd.
Shri H. K. Chakraborti ,, ,, ,, ,,
Shri L. H. Doss ,, ,, ,, ,,
Shri G. W. Pope—Shalimar Works (Private) Ltd.
Shri C. J. N. Will } R.S. N. Co. Ltd., and I.G.N. & Railway Co. Ltd
Shri E. G. Hodges
Shri N. P. Mehta
Shri A. N. Shah
Shri B. B. Shah
Shri A. C. Sen } Ship Repairers Ltd.
Shri D. A. Gandhi
Shri A. G. Kamdar
Shri A. Majumdar
Shri B. R. Karkaria
Shri D. C. W. Watkin } B.A., S.S. & Port Shipping Co. Ltd.

Ship repair Workshops—(Contd.)

Shri J. Lawson—Port Engineering Works Ltd.
Shri Kapil Bhattacharjee—People's Engineering & Motor Works Ltd.]
Shri Ching Wah—Ching Wah & Co.,
Shri R. S. Jayaswal }
Shri A. C. Roy } Jayaswal Engineering Co. Ltd.

Agents of Foreign Shipping Lines:

Shri R. J. G. Nicholls—Mackinnon Mackenzi & Co. Ltd.
Shri Pearson } Burmah Shell Oil Storage and Distributing Co. of
Shri L. P. H. Todd } India, Ltd.
Capt. D. G. Gale—Marine Supdt. Bank Line Ltd.
Shri H. Kidd—Engineer Superintendent, Bank Line Ltd.
Capt. E. C. G. Young—Asiatic Steam Navigation Co. Ltd.
Shri J. D. Clarke } Marine Superintendent—M/s. Brockle Bank Line Ltd.
Shri A. McKie } Eng. Superintendent.
Capt. A. Mcsweeney—Goldston Lyall & Co.
Shri T. G. Law—Jardine Henderson Ltd.
Capt. G. R. Miller—American Export Lines.

Suppliers of Stores, Importers, and Shipchandlers:

Shri D. D. Dutt } T. C. Chatterjee & Co.
Shri N. C. Banerjee }
Shri B. K. Dutt—Eastern Co. Private Ltd.
Shri M. Chatterjee—India Marine Service.
Shri R. N. Rudra—Bengal Traders Syndicate.
Shri K. Banerjee—Bonar Bros. & Co.
Shri A. C. Mukerjee—Don Watson & Co. Private Ltd.

Owners of Inland Vessels:

Shri K. C. Chatterjee—Indian Shipping Co. Ltd.
Shri Praksh Chand Jain—The Pioneer Shipping Co. Ltd.
Shri J. P. Shah—Neptune Navigation
Shri S. C. Bhattacharjee— " "
Shri P. C. Sur—Indo Swiss Trading Co. Private Ltd.

Government Departments:

Shri I. S. Sud } Directorate General of Supplies & Disposals.
Shri P.V. Ramanathan }
Shri S. K. Sen—Joint Chief Controller of Imports & Exports.
Shri A. C. Whitcher—Collector of Customs.
Shri M. Panchappa—Deputy Collector of Customs.

VISAKHAPATNAM

Port Administration:

Shri C. R. Reddy—Port Administrative Officer.
Shri E. H. Glassup—Deputy Conservator.
Shri A. V. Delima—Mechanical Superintendent.
Shri G. Parthasarathy—Secretary.

Hindustan Shipyard Private Ltd:

Commodore B. N. Lele—Managing Director.
Shri H. C. Raut.

Agents of Indian & Foreign Shipping Lines:

Shri Lang—Gordon Woodroffe & Co. Agents Clan Line.
Shri G. Ramayya—Scindia Steam Navigation Co. Ltd.
Shri M. K. T. Arasu—Volkart Brother. Agents H.B.B.L., LT., Hoegh Lines, J.P.H.L.
Shri P. C. S. Dutt.—K. Rambrahmam & Sons Agents: Great Eastern Shipping Co. Ltd.

Caltex Oil Refineries (India) Ltd.

Shri D. M. Berdine—Managing Director.
Shri H. R Tittworth—Company Officer.
Capt. H. A. Bronson—Company Officer.

MADRAS

Port Administration:

Shri K.N. Srinivasan—Acting Chairman, Madras Port Trust.
Shri W.E. Vangeyzel—Deputy Port Conservator.
Shri P. C. Martin—Mechanical Engineer.
Shri V. S. Ananthanarayan—Executive Engineer.
Shri V. A. Jaywant—Traffic Manager.
Shri U. S. A. Ghaffoor—Deputy Traffic Manager.
Shri T. K. Parmeswaran Nambiar—Secretary.

Agents of Indian and Foreign Shipping Lines:

Shri K. A. Sillick—Gordon Woodroffe & Co. (Madras) Ltd.
Shri V. C. Parthasarathy —Bombay Company Ltd.
Shri P. P. Nair—Parry & Co. Ltd.
Shri W. J. Wickes—Shaw Wallaced & Co. Ltd.
Shri K.G. Haja Shareeff—S.K.V. Shaikh Mahomed Rowtherd & Co.
Shri A. S. Marwah—South India Corporation (Agency) Ltd.

Principal Officer—Mercantile Marine Department:

Capt. S. K. Kumarhia—Principal Officer, Mercantile Marine Department.

Harbour Engineering

Shri D. J. Hayden.

Binny's Engineering Works (Private) Ltd.

Shri Leigh—Director
Shri C. C. Thomas—Works Manager.

Surveyor:

Shri V. L. Hillgour—Surveyor, Lloyds Register of Shipping.

State Port Officer:

Inspecting Dredging Engineer—Representing State Port Officer for Minor Ports. (Madras State).

MANDAPAM

Shri A. Rama Rao—Marine Superintendent, Southern Railway.

TUTICORIN

Shri G. M. Chikhalikar—Port Officer.
Shri Pereira—Pereira & Roche.

COCHIN

Port Administration:

Shri M. S. Venkataraman—Administrative Officer.
Shri C. V. Venkateshwaran—Chief Engineer.
Shri B. D. Irani—Mechanical Superintendent.
Shri Bose—Traffic Manager.
Shri Cyril Raj—Secretary.

Mercantile Marine Department:

Shri T. S. Rajan—Engineer & Ship Surveyor.

Agents of Indian & Foreign Shipping Lines:

Shri F. Wichser—Volkart Brothers.
Shri J. R. Kerr—Aspinwal & Co.
Shri Bachubhai Asher—Mooljee Jaitha & Co. (Scindia Steam Navigation Co Ltd).
Shri Rajmani—Great Eastern Shipping Co. Ltd.
Shri G. V. John—Madura Co. Private. Ltd.
Shri A. J. Jacob—A. V.Thomas & Co. Ltd.
Shri S. Subramanian—The Bombay Co. Private Ltd.
Shri A. Das Gupta—Burmah Shell Oil Storage & Distributing Co. of India Ltd.
Shri D. E. Phelips—Harisons & Crossfield.
Representatives—Darrah Smail & Co. Abmassador Steamships Ltd.

***Ship Repairers*:**

Shri K. V. Rao—Manager, Brunton & Co., Engineers.

BOMBAY

Port Administration :

Shri L. T. Gholap, I.C.S.—Chairman, Bombay Port Trust.
Shri V. Vaz—Docks Manager.
Shri S. B. Dalal—Chief Engineer.
Shri Sud—Mechanical Engineer.
Shri Mehta—Chief Labour Officer.
Superintendent in charge—Hughes Dry Dock.

Indian National Steamship Owner's Association :

Shri Vikramsingh S. Vallabhdas—Vice President, Malabar Steamship Co. Ltd.
Shri K. P. Shah—Hon. Secy., Scindia Steam Navigation Co. Ltd.
Shri N. P. Mehta—Bharat Line Ltd.
Capt. J. C. Anand—Marine Superintendent, Scindia Steam Navigation Co. Ltd.
Shri B. Ananda—Deputy Marine Superintendent, Great Eastern Shipping Co. Ltd.
Shri C. Tye—Marine Superintendent, India Steamship Co., Ltd.
Shri S. K. Aier—Secretary.

Ship Repair Workshops :

Shri G. E. Kerr—Managing Director, Mazgaon Dock Ltd.
Shri R. M. Sellers—Asstt. Shipyard Manager, Mazgaon Dock Ltd.
Shri A. C. Kidd—Asstt. Manager Repairs, Mazgaon Dock Ltd.
Shri J. Green—Asstt. Manager, New Construction, Mazgaon Dock Ltd.
Col. W. C. Cole—Personnel—Manager, Mazgaon Dock Ltd.
Shri S. N. Morarjee—Director, Scindia Workshop Private Ltd.
Shri D. E. Wadia—Manager ,, ,, ,, ,,
Shri D. B. Daruwalla—Supdt. Engineer ,, ,, ,, ,,
Shri S. M. Kapadia—Controller of Stores ,, ,, ,, ,,
Shri Campbell—Alcock Ashdown & Co. Ltd.
Haylor— ,, ,, ,,
Capt. B. A. Samson, I. N. Capt. Supdt. Naval Dockyard.
Shri M. B. Shaparia—Shaparia Engineering & Docking Co. Ltd. Representative of Marconi International Marine Communication Ltd.
Captain Stevens—E. W. Stevens & Co.
Shri Abdulla—Modern Marine & Mechanical Works.
AFCO Private Ltd.
Nirmal Ship Repair Works.

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Agents of Foreign Shipping Lines :

Shri D. J. Haley—Anchor Line Ltd.
Shri D. Matheson—Mackinnon Mackenzie & Co. Private Ltd.
Capt. R. Brignall—British India Steam Navigation Co. Ltd.
Capt. H. Morini—Turner Morrison & Co., Ltd.
Capt. W. H. Dalton —Ellerman Lines Ltd.
Shri F. Rozario—Killick Nixon & Co. Private Ltd.
Shri N. M. Mehta—Forbes Forbes Campbell & Co. Ltd.

Government Departments :

Colonel Eapen—Deputy Iron & Steel Controller, Bombay.
Shri M. G. Abrol—Collector of Customs.

Chipping and Painting Employers' Association :

Shri S. C. Sheth.
Shri Fali R. Kumana.
Shri Dinshaw A. Dhunjibhoy.
Shri R. C. Thakore.

Mercantile Marine Department :

Capt. W. G. Piggott—Nautical Surveyor.
Shri T. Berry—Principal Officer.
Shri R. L. Rikhye—Nautical Surveyor.

Mercantile Marine Department—contd.

Shri M. S. Patel—Nautical Surveyor.
Shri R. C. Karnick—Ship Surveyor.
Shri K. Parthasarathy—Deputy Chief Surveyor.
Shri J. M. Trindade—Engineer and Ship Surveyor.
Shri S. Ratra—Engineer and Ship Surveyor.
Shri P. G. Blake—Radio Inspector.

Classification Society Surveyors:

Shri C. K. Stevenson—Lloyds Register of Shipping, Bombay.
Shri H. A. Amos—Bureau Veritas Norske Veritas—Gemanis cher Lloyd—R. Italiano—A.
Shri P. B. Leahy—American Bureau of Shipping.
Shri S. B. Aga—American Bureau of Shipping, Japanese Marine Corporation.

Suppliers of Stores, Importers and Shipchandlers :

Shri Ahmed S. Moloobhoy—Ahmed & Moolobhoy & Sons.
Shri Mustan Tyebjee and Shri Sitaram—Amiruddin Shalehoy Tyebjee & Sons.
Shri Fakruddin—Moosaji Jeevaji.

KANDLA

Shri B. D. Naygandhi—Assistant Traffic Manager.
Captain D. V. Singh—Deputy Conservator.
Shri T. P. Khubchandani—Mechanical Superintendent.
Dr. R. P. Bhargava—Secretary to the Development Commissioner.

SAURASHTRA PORTS

Shri H. P. Oza—Principal Port Officer and Engineer, Bombay State.
Shri Chunilal—Port Officer, Bedi, Bunder.
Shri T. N. Oza—Port Officer, Veraval.
Capt. D. K. Tamhane—Port Officer, Okha.
Shri D. S. Adam—Asstt. Port Officer, Okha.
Shri G. B. Mankodi—Tug Engineer & Floating Stock Supervisor.
Shri D. Y. Virkar—Port Officer, Bhavnagar.
Shri K. H. Gohel—Deputy Engineer, Bhavnagar (Mech.).
Shri Dave—Executive Engineer.

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ANNEXURE—(V) (A)

Statement showing briefly whether and to what extent facilities are available with the workshops of the ***PORT ADMINISTRATIONS*** *at the Major Ports in India* ....

(See also Annexrure VI)

Facilities	Calcutta	Vizag.	Madras	Cochin	Bombay	Kandla
1. *Drawing Office* .	Yes. Main drawing office attached to workshop for maintenance and repairs to port vessels and equipment. 2 draftsmen specially trained. Another drawing office in Deputy Conservator's Department.	Yes. In Mech. Dept. 1 Draftsman 1 Apprentice.	Yes. Fully staffed with Engineers & draftsmen for normal maintenance and development work of the Port.	Yes. One Draftsman in Mech. Supdt.'s Office.	Yes. 5 Draftsmen—For normal maintenance & development work of Port only.	No
2. *No. of ships which can be repaired.* (*a*) Periodic or annual surveys. (*b*) Running repairs.	 18 at a time 75 over a year 3 at a time 40 over a year	Carry out repairs to Port Craft only.	Carry out repairs to Port Craft only.	One at a time and 8 over a year carry out repairs to part craft viz., Tugs, Dredgers. 12 Floating Pontoons, 1 Floating Crane, 1 Grab Dredger, 12 launches and several barges.	Port flotilla numbering 80 of Dredgers, Tugs, Pilot Boats, Floating Crane, Hopper barger, Coal barges, launches etc. over-hauled annually withsix monthly Drydocking or Slipping and boilercleaning.	1 at a time—Floating Dock not suitable for merchant ships.
3. *Equipped for carrying out*	Yes. (capacity normally occupied on port's own craft.)					
Plating and Sheet metal work.	Do.	Yes	Yes Capacity normally fully occuped on Port's own craft.	Yes Capacity normally fully occupied on Port's own crafts.—Can carry out chipping and painting.	Yes. Capacity normally-fully occupied on Port's own craft. Chipping and painting and Radio and Radio Navigational aids repairs on annual contract. Skeleton staff for Radio and geration repairs.	Yes
Plumbing Work	Do.	Yes—to a limited extent	Yes	Yes	Yes	Yes.
Carpentary and Joinery work.	Do.	Yes	Yes	Yes	Yes	Yes
Electrical Work	Do.	Yes—to a limited extent	Yes	Yes	Yes	Yes
Main & Aux. Machinery repairs.	Do.	Yes	Yes	Yes	Yes	No.
Boiler repairs	Do.	Yes—to a limited extent	Yes	Yes	Yes	
Furnishing	Do.	No	No.	No.	Yes	No.

4. *Shifts worked*						
Week Days—In shop—on Ships.	Single shift normally.	Single shift.	Normally single shift except some sections.	Normally single shift.	Normally single shift with occasional overtime.	Single shift normally
Sundays and holidays.	As and when necessery.	Only in emergencies	Only in emergencies.	Only in emergeneis	Only in emergencies. Port staff work double shifts of 12 hours each. Skeleton Port staff Sundays and on Holidays.	Yes, if necessary.
5. *Strength of staff*						
Sup. Tech. .	3	7	4	4	10	2
Supervisory .	17	14	Foreman and chargemen in all departments.	7	25	12
Skilled . .	941		1,000—About 500 permanent & 500 casual	Skilled—287 (238 permt.).	Skilled—691 (627 permt.).	40 (20 casual).
Semi-skilled and .	113			Semi-skilled—143 (135 permt.).	Semi-skilled—105 (103 permt)	
Unskilled labour .	208 Casual as and when necessary.	318 (all permanent).		Unskilled—251 (209 permt.)	Unskilled—669 (623 permt.).	
6. ***Plant and Machinery.***						
Lathes—Centre .	19	13	17	14	38 (in machine shop 2 in carpenting shop).	6
Capstan .	2	Nil	2	Nil	Nil	Nil
Turret .	1	Nil	1	Nil	2	Nil
Milling machines .	1	1	3	1	3	1
Shaping machines	3	2	2	2	3	1
Planing machines	2	1	3	2	3	1
Cutting machines	3	1	2	2	Nil	1
Welding plants .	15	7	8		7 (transformer) in boiler shops. 6 (5 Nos. Diesel engine driven. 1 No. Electric motor driven) in motor shop.	2
Air compressors . Stationery—Portable.	8	1	7	3	5 diesel 1 electric 1 stationary	2

ANNEXURE V(A)—*contd.*

Facilities	Calcutta	Vizag	Madras	Cochin	Bombay	Kandla
Wood working machines.	30	2	5	1	14—circular saw, band saw, drilling, planing and thicknessing etc.	3
Shearing, cutting, punching and bending machines.	13	1	2	4	6—Punching, shearing, plate bending frame bending circle cutting etc.	1
Power Presses .	Nil	2	Nil	Nil	Nil	Nil
Overhead cranes in workshops.	Nil	2 (7½ tons capacity) 1 (5 tons capacity).	5 (3 to 10 tons cap.)	2 (Gantry cranes 5 and 2 tons capacity.).	2 (5 tons cap.)	Nil
Crank shaft Grinding machines.	1	Nil	Nil	Nil	Nil	1
Testing machines	2	Nil	1	1—Rope and chain testing	Nil	Nil
Galvanising plant .	Nil	Nil	Nil	Nil	Nil. *Note* : Several drilling, Grinding, screwing and boring machines.	Nil
7. Forge shop and Foundry.	20 tons a month upto 14" sq. bloom	No Hot forging shop —Smithy with 10 cwt. power hammer.	Forging machine—5 cwts	Forging 4 tons per month steam Hammer—10 cwt.	Forging shop. 1 steam hammer 10 cwt. 1 Pneumatic hammer 3cwt 2 ,, ,, 15 cwts. 1 ,, ,, 5 cwts. 1 mechanical hammer max. Forging 1 ton. 6 tons per month.	Yes—But the forging and foundry shops have not as yet been put into commission.
Capacity : (individual Castings/monthly out put						
Ferrous .	25 tons per month	Up to 2½ tons.	16 ton per month	2½ tons per month.	No Ferrous castings.	
Non-Ferrous .	7 tons per month. Ferrous up to 5 tons Non-Ferrous upto 10 cwts.	Up to 10 cwts. 15 tons a month (total)	1½ tons per month. 1 ton Ferrous 7 cwts. non-ferrous	1/2 ton per month. 5 cwts. Ferrous. 100 lbs. Non-ferrous.	Max. 2 cwts. 6 tons a month.	

8. Annealing and case-hardening furnace.	2 Annealing furnaces (1 plate annealing furnace 11' × 10½' × 6' × 1'9" fired by 2 grades—5' × 2'6" each 1—Chain annealing furnace—5' × 2' × 3'8½" fired by grate area of 10 sq. ft. No case hardening furnace.	Yes—For ships equipment. Yes—Case hardening small parts and tools.	1 Anealing furnace cap. 2½ tons.	One case hardening furnace. One annealing furnace for chains, shackles, hooks—on order.	Yes—1 Annealing. 1 case hardening. 1 Annealing and chain testing.	Yes, Partie Bogie hearth annealing and normalising furnace 4'0" × 6'0" effective length Maximum temperature 1000 C. complete with Pyroneter.
9. Equipment for Aluminium alloy lifeboats, superstructure.	Nil	No	No	No	No	No
10. Equipment for repairs in stream.	Only partially—1 launch 1 barge and some portable machines for carrying out minor repairs.	No	Port craft can be repaired at moorings.	Portable welding sets and compressors available.	Yes—If necessary.	No. except in emergencies.

NOTE :—Except in case of emergency or urgent need work relating to—

(a) Cleaning, chipping and painting
(b) Repairs to Radio and Radio Navigational aids.
(c) Refregeration repairs.
(d) Insulation

is normally entrusted to sub-contractors who specialise in such work.

ANNEXURE V(B)

Statement showing breifly whehter and to what extent facilities are available in workshops of selected minor ports

Facilitites	Bhavnagar	Okha	Bedi	Veraval	Remarks
1. *Drawing Office* .	..	..	..	..	Yes. Each division under executive Engineers head quarters at ports Bhavanagar, Okha has Drawing office with all necessary equipment.
2. *No. of ships which can be repaired.*					
(*a*) Periodic or annual surveys.	12 vessels upto 200/ car be repaired or surveyed, size being limited by the dry-dock.	..	..	6 to 8 vessels upto 150/ in length can be repaired or surveyed, size being limited by the dry-dock.	
(*b*) Running repairs .	3 at a time.	..	..	4 lighters at a time.	
3. *Equipped for carrying out* :					
Plating and sheet metal work.	Yes.	..	..	Yes.	

Plumbing work .	Yes.	..	..	Yes.	
Carpentry and Joinery work.	Yes.	..	Yes.	Yes.	
Electrical work .	Yes.	..	..	Yes.	
Main and Aux. machine repairs.	Yes.	..	Yes.	..	
Boiler repairs .	Yes.	..	Yes.	Yes.	
Furnishing .	Yes.	..	Yes.	Yes.	
4. *Shifts worked*					
Week days—In shop—on ships.	Single Shift in shop.	Single shift in shop.	Single shift in shop.	Single shift in shop.	
Sundays and holidays	..	..	..	..	
5. *Strength of staff*					
Sup. Tech. .	3	2	2	2	
Supervisory . .	2	1	4	2	
Skilled . . .	92	24	1	16	
Semi-skilled .	8	2	37	8	
Unskilled Labour . .	70	15	9	4	Staff is permanent in all ports.
6. *Plant and Machinery.*					

ANNEXURE V(B)—contd.

Statement showing briefly whether and to what extent facilities are available in workshops of selected minor ports

Facilities	Bhavnagar	Okha	Bedi	Veraval	Remarks
(*a*) Lathes—(*i*) Centre, (*ii*) Capstan and (*iii*) Turret. (*b*) Milling machines (*c*) Shapping machines (*d*) Planing machines (*e*) Cutting machines (*f*) Welding plants (*g*) Air compressors (*h*) Wood working machines. (*i*) Searing, cutting, punching and bending machines. (j) Power Presses (*k*) Overhead cranes in workshops. (*l*) Crank shaft Grinding machines. (*m*) Testing machines (*n*) Galvanising plant	All types of machines available except (e), (*g*), (*i*), and (*n*).	All types of machines available except (*a*) (*iii*) , (*b*), (*e*), (*g*), (*i*), (*l*), (*m*) and (*n*).	All types of machines available except (*b*), (*d*), (*e*), (*g*), (*i*), (j), (*k*), (*l*), (*m*) and (*n*).	Only centre lathes, Milling machines and chipping machines available.	
7. *Forge shop and Foundry.*					
Capacity : Ferrous . . Non-Ferrous . Largest size . .	Belt driven Hercules hammer is of 160 lbs. Both ferrous and non-ferrous metals can be casted, the capacity of the foundry being about 4 tons a month.	..	..	Smithy and Foundry available. Belt driven hammer of about 150 lbs. Both Ferrous and Non-ferrous metals can be casted the total capacity of Foundry being about 2 tons per month.	

8. *Annealing and case-hardening furnace.*	..	..	..	..
9. *Equipment for Aluminium alloy life-boats, superstructure.*	..	..	..	..
10. *Equipment for repairs in Stream.*	Has portable welding plant compressors and Pneumatic tools and gears for carrying out repairs if required in stream.	..	..	..

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ANNEXURE VI

Particulars of Floating Cranes, Water-barges, Dry Docks and repair berths available at all ports.

CALCUTTA

Calcutta Port Commissioners :

Floating Cranes :

One 60 Ton Steam Operated self-propelling.
One 30 Ton Steam Operated self propelling.
One 30 Ton diesel operated non-self propelling.
One 16 Ton non-self propelling.

Water Barges :

One Dumb Water Barge in King George's Dock One Water Boat (100 Ton Capacity) mainly used for supply of water to Port Craft only. Supply of fresh water to merchant ships is made by Calcutta Corporation who have their own water boats.	Owned by the Port Commissioners.

Repair Berths :

There are three berths; two in Kidderpore Docks and one in King George's dock used for laying up vessels under major surveys, repairs and overhauls. Vessels are usually double-banked so that six vessels can be berthed at a time in the three Berths.

Dry Docks :

Five dry docks, three in Kidderpore Docks and two in King George's for use of merchant ships. In addition, there is one graving dock and a number of slipways at the port workshops for reapirs to port launches, tugs and small vessels—(*see* particulars below)

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THE COMMISSIONERS FOR THE PORT OF CALCUTTA—DRYDOCKS

Name and No. of Dry Dock	Length from Caisson to head or between Caissons Coping Head	Maximum length on Keel Blocks	Entrance Breadth M. H. at Sill W.S. level	Depth at Mean High water Springs			Height of Keel Block	Breadth of Dry Docks at top of Blocks	Dimension of Largest ship that can be taken	
				Water on sill	Water on Block Aft.	Water on Blocks For'd			Length	Beam
				Maximum Draft of Ship						
King George's Dock No. 1	600'—6"	500'—0" 80'—0"	36'—0" Dry Docks are non-tidal & not Affected by range of tide.	32'—0"	32'—0"	4'—6"	32'—0"	550'—0"	550'—0"*	75'—0"
King George's Dock No. 2.	615'—0"	500'—0"	80'—0"	36'—0"	32'—0"	32'—0"	4'—6"	90'—9"	550'—0"*	75'—0"
Kidderpore Dry Dock No. 1.	547'—0"	507'—0"	67'—0"	25'—0"	22'—0"	22'—6"	4'—6"	67'—0"	520'—0"	63'—0"
Kidderpore Dry Dock No. 2	497'—0"	463'—0"	67'—6"	27'—0"	22'—0"	22'—0"	4'—0"	66'—0"	470'—0"	63'—0"
Kidderpore Dry Dock No. 3.	350'—0"	321'—0"	57'—0"	23'—0"	22'—6"	22'—6"	3'—0"	50'—0"	335'—0"	48'—0"

*King George's Dry Docks are arranged in tandem and can be used as one dock. They can be entered only from the Wet Dock. The river entrance to the Dry Dacks has been permanently closed by the construction of a cafferdam at the river end of the dock. This permits the removal of the caisson and increase the effective length of No. 2 Dry Dock to 620.

Bilge Shore :	All vessels are fitted with bilege shores and the number, longitudinal spacing, and transverse distance from the centre line of keel blocks is dependent on the dimensions, style of construction and displacement of vessel.
Bilge Blocks.	Bilge blocks of the same design as the keel blocks are only used in very special cases and the disposition is determined in accordance with the circumstances necessitating their requirements.

Sill Depth of water on	In all five dry docks the sill levels are below the level of the keel blocks and therefore the depth of water over the blocks is given.
Manoeuvring space :	Kidderpore Dry Docks are entered from the Turning Basin, 680′—600′ non-tidal. The entrance to No. 1 and 2 Kidderpore Dry Docks is approximately at 90 degrees to the lock and No. 1 Main Dock Entrance and vessels entering these docks are turned in the Basin by hassers from ship to shore capstans. No. 3 Kidderpore Dry Dock runs parallel to the 80′. Lock and vessels using this dock are manoeuvred into the dock hawsers from ship to shore capstans. Entrance to King George's Dry Docks is from main dock and ships are manoeuvred to the entrance of the dock by tugs.
Water Supply :	Arrangement for Magazine Flooding and fire fighting is provided. At Kidderpore Docks there is a hydraulic system encircling No. 1, 2 & 3 Kidderpore Dry Docks pressure 600 lbs. per sq. inch.* An additional supply of water is also available at Nos. 1, 2 & 3 Kidderpore Dry Docks for circulating and testing Delivery capacity approx. 50 tons per hour. Drinking water is not laid on at Kidderpore Dry Docks, but sufficient supply can be made from barge. At King George's Dry Docks there is an unfiltered supply available of 50 tons per hour at each dry dock, for magazine flooding, fire fighting, testing and circulating requirements. Direct supply of drinking water from down stream side of Nos. 1 & 2 Dry Docks is available.
Cranes :	Kidderpore Dry Docks—One 4 tons at 45 radius is located between Nos. 1 & 2 Dry Docks. King George's Dock (Dry)—One 3 tons at 45′ radius and one at 25 ft. radius are located on the down stream side of Nos. 1 & 2 Dry Docks, and in addition two 3 tons at 25 radius on the up stream side.
Electric Supply:	Available at King George's Dry Docks—D.C. 220 Volts up to 500 Amps. A.C. 220 Volts three phase 10 Amps. A.C. 220 Volts single phase 10 Amps. A.C. 500 Volts three phase 100 Amps. Available at Kidderpore Dry Docks—D.C. 220 Volts 50 Amps. D.C. Amps. D.C. 440 Volts 100 Amps.
Compressed *: *Air*	Kidderpore Dry Docks—Available at Nos. 1, 2 & 3 Dry Docks. King George's Dry Docks—Available at Nos. 1, & 2 Dry Docks.

Plans for improvement :

Proposals for improving dry dock facilities under the Second Five Year Plan cover :

Installation of a 25 ton derricking crane on the south side of King George's Dock dry dock.

Installation of a 3 ton crane on the north side of King George's Dock dry dock.

Installation of a 3 ton and two 2 1/2 ton steam cranes at Kidderpore Dock dry dock.

Installation of a 500' air compressor at each of the dry docks.

Improvement of electric supply and sanitary facilities at the dry docks.

CALCUTTA *(contd.)*

Private Ship repairing Firms :

Garden Reach Workshops Ltd.,

Repair berths : No repair berths for deep sea vessels but facilities are available for docking and repairing Inland, Light Draft and Coastal Vessels in the 2 dry-dock and 6 slipways in the Workshop.

Dry-Docks : No dry-docks for deep sea vessels. Two drydocks in the Workshop with entrance from the tidal water of the River Hooghly and suitable for construction of inland, light draft coastal vessels of approximately 2,000 tons, launching wt. 1,200 tons and docking and repairs to vessels upto 9 feet maximum draft.

	Length of keel blocks	Width of Entrance	Depth of Sill at Main High Water.
No. 1 Drydock	464 ft.	59'—5"	10'—2"
No. 2 Drydock	326 ft.	59'—7"	9'—8"

Also maintain a Mould Loft for new constructions.

Slipways : Five open slipways and one covered slipway are available. Slipway suitable for Coasters Paddle Steamers, Tugs, Barges and Launches.

Vessels upto 1,200 tons can be accommodated.

No. 1 Patent Slip : Cradle constructed of wood suitable for small launches and boats.

No. 2 Patent Slips : Cradle constructed of wood fitted with transverse carriages and two side berths with accommodation for three vessels, two side berths respectively 260'—0" and 200'—0" extreme length and 68'—0" and 40'—0" width.

No. 3 Patent Slip : Cradle constructed of wood, fitted with two transverse slips length 260'—0" width 51'—0".

No. 4 Patent Slip : Cradle constructed of steel, fitted with two transverse slips, length 320'—0' width 70'—0'.

No. 5 Patent Slip : Cradle constructed of steel with side transversing as necessary.

No. 6 Covered Slip : Way in Boat Shed suitable for Motor Launches and lifeboats upto 60'—0".

Facilities at Drydocks and slipways : Repairs to deep sea vessels are carried out in the Port Drydocks or at River moorings, where port facilities are used. Portable Generating Sets and Air Compressors available.

For Inland, Light Draft and Coastal Vessels the following are available in the Workshop :—

Fresh Water

Fresh water for drinking purposes is supplied by Local Municipality to underground reservoir which is pumped up to overhead Tank and supplied through the Yard by gravitation.

There is provision for supply of drinking water and water for boilers, which is drawn from a tubewell and stored in a overhead tank.

Power Supply :—

Extensive power supply connections with plug in points suitably placed at various places throughout the yard—at Dry Docks, Slipways, Jetties, for ready supply when required.

adequate arrangements for supply of temporary lights for night work etc. and/for vessels under repairs.

(I) MOBILE CRANES :

There are 5 Mobile Cranes :—

4 Nos. Coles Mobile Cranes 5 Ton capacity each.

1 No. Coles Mobile Crane 12 1/2 tons capacity.

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(II) JETTY CRANES :

5 Jetties, each equipped with a Jib crane (varying from 6 to 20 tons capacity).

COMPRESSED AIR :

Compressor House at No. 3 Slipway :

Three Nos. Stationary two Stage Single Acting Air Cooled Air Compressors with 60 H. P. A.C. Motor and Control housed in a permanent structure at the head of No. 3 Slipway, feed the Slipway and surrounding area with necessary Air Supply Lines.

Compressor House No. 4 Slipway :

Three Nos. Stationary two Stage Single Acting Air Cooled Air Compressors with 60 H.P. A.C. Motor and Control housed in a permanent structure at the head of No. 4 Slipway, feed the Slipway, Foundry and surrounding area with necessary Air Supply Line.

Fire fighting :

The Works Fire Brigade with Trailer Pumps stratagically stationed in the Yard.

Necessary water service main is fitted throughout the Yard with necessary Hydrants fitted at suitable places for using house connections . The supply of water is from the River and/or Static Tanks.

There is a Fire Float fitted with 2 Chrysler Motor Pumps and with equipment to stand by at River Front day and night.

Static Multi Arc Electric Welding Sets :

Multi Arc (6 operators) Electric Welding sets are installed to serve various shops and Slipways. A large fleet of Portable sets are maintained to supplement supply when necessary.

Liquid Oxygen Supply:

A Liquid Oxygen Supply Plant is installed together with necessary lines for the supply of Liquid Oxygen to Nos. 2 and 3 Slipways, No. 2, Dock, Boiler and Platers Shop.

Sand Blasting Equipment:

Sand Blasting Equipment for cleaning the Hulls of Vessels in our Dry Docks and Slipways is available.

Barges, Launches, Tugs :

3 Steam Launches
4 Barges
5 Bholios.
Several Cars, trucks, lorries with trailers etc.

Internal Transport—
1—Four Ton Dumper
1—2½ Ton Tractor
—2 Nos. Auto Trucks with 2 Nos. 1½ ton trailors.
6—1½ Ton Auto trucks.
1—4 Ton Lorry and 3 Ton Trailor and several hand trollies.

THE HOOGHLY DOCKING & ENGINEERING CO. LTD.

Repair Berths : No repair berth for Deep Sea Vessels. One Repair Berth available for Inland and Coastal vessels of upto approximately 250 ft. length and maximum permissible draft of 25 ft. No repair berth for deep sea vessels. Repairs to these vessels are carried out in Port berths or River moorings.

Drydocks : One Drydock length 300 ft. width 42 ft.— Can take vessels upto maximum draft of 15 ft.

Slipways : No railed slipways, but there are 4 Building berths in the Workshop which take small Barges, Launches, etc. for repairs.

Facilities at Dry-Docks-Slipways in the Workshop:

Fresh water :— Adequate supply from tube wells and from Municipal Supply.

Power :— 110 volts and 220 volts D. C. and 220 /440, 3 phase 50 cycle A. C. supply. Can also supply portable Diesel Driven 110 Volts Generators.

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Cranes :— On the repair berth a 15 ton crane and on the drydock a 10 ton crane.
Compressed Air :— Ample supply of compressed air at 80/100 lbs./sq. in. available.
Fire Fighting :— Adequate facilities for fire fighting available.

Barges, Launches, Tugs :

1. Barge
2. Launches

Several cars and trucks and one tractor and trailer available.

PORT ENGINEERING WORKS LIMITED

No repair berths or drydocks.

Slipways :

6 Slipways of 272'—0" length 7'—1" width.

1 Slipway of 230'—0" length 7'—1" width.

3 Slipways of 432'—0" length 20'—2½" width.

Capable of accommodating vessels of upto 250 tons, flats 200'—0" long.

(600 tons) and barges of upto 100 tons. Slipways equipped with 3—500 volts electric motors for Haulage.

Facilities at the Slipways :

Fresh water—Adequate supply of fresh water from tubewells.

Power—Adequate supply.

Cranes—Mobile Crane 6 tons and two of 2 tons each.

Compressed Air—2 stage air compressor—Capacity 236 cu. ft. air at 100 lbs./sq. in. pressure.

Fire fighting—Ten fire extinguishers.

Barges, Launches, tugs, etc.

3 Motor Diesel launches.

Adequate cars and lorries.

THE SHALIMAR WORKS (PRIVATE) LIMITED

No repair berths or drydocks.

Slipways : 3 slipways for construction or repairs to small vessels of upto 120 ft. in length.

Facilities on the Slipways in the Workshop :

Compressed Air, Power and Fresh water supply available in the Workshop.

Barges, Launches, Tugs, etc.—2 Barges; 2 Launches; Several cars and lorries available

THE PEOPLE'S ENGINEERING AND MOTOR WORKS LIMITED

No repair berths or Drydocks for deep sea vessels.

Repair berths : 4 repair berths for new construction and repair of inland vessel capable of accommodating vessels upto 300 ft. in length with a maximum draft of 6 ft.

Dry-docks : One Dry dock of 250' length
55' width
12' depth

Without lock gates.

Slipway : One Slipway with a winch for hauling up vessels upto 100 tons with space for 3 such vessels in tandem—on which river craft of all kinds constructed and repaired.

Facilities at Drydocks slipways :

Fresh water—From Municipal Mains.
Cranage—Nil.
Compressed air ; Two compressors capable of giving about 200 C.F.M. air at 100 lbs. sq. in.
Fire-fighting : Portable fire extinguishers.

Barges, Launches, Tugs, etc.:

4. Steel barges (100 tons each).

2 Steam tugs.

Cars and trucks available.

INDIA GENERAL NAVIGATION AND RAILWAY COMPANY LIMITED

Repair berths : River frontage and five jetties capable of berthing ten inland steam or motor vessels for repairs.

Drydocks : 3. Drydocks suitable for docking shallow draft inland steam or motor vessels.

	Length	Breadth	Depth on Sill at High Water Level
Drydock 1	600 ft.	66 ft.	10·6 ft.
Drydock 2	600 ft.	65 ft.	8·6 ft.
Drydock 3	330 ft.	70 ft.	11·0 ft.

Slipways :—2 Slipways of following dimensions :

Extreme length	620 ft.	625 ft.
Length of cradle	255 ft.	255 ft.
Draft on keel blocks at High Water Ordinary	5 ft. forward	5 ft. forward
Spring Tide	12 ft. aft.	13 ft. aft.
Lifting Power	600 tons	800 Tons.
Difference between High Water at Ordinary Springs and Ordinary neaps . .	6 ft.	6 ft.
Cradle Telescopes	36 ft.	40 ft.

Facilities at Drydocks and Slipways in the Workshop :

Fresh water . . Municipal Supply sufficient to meet the internal needs of the Workshop.

Power : Installed capacity of 1300 KVA.—Can supply shore current at 220 volts D.C. Also available 440 volts A.C. and 230 volts D.C.

Cranage :

Jetty Crane electric	10 tons @ 30 ft. radius.
Jetty Crane electric .	1 1/2 tons @ 12 ft. radius.
Jetty Crane Steam .	15 tons @ 14′-6″ radius.
Jetty Crane Hand .	3 tons @ 13′-9″ radius.
2 Hyster Mobile cranes .	4·4 tons @ 3 ft. radius. 2 tons@ 9 ft. radius.
Coles Mobile Crane .	12 tons @ 10 ft. radius. 2 tons @ 25 ft. radius.

Compressed Air : Two Motor Driven Air Compressors. 525 c. ft./Min. at 100 lbs./sq. in.

Two Ingersol Rand—Portable—Diesel driven compressors.

Storage of Oxygen 14,000 cu. ft. delivery @ 44 lbs. /sq. in.

Fire Fighting : Two trailor pumps with 5″ suction plus a large number of Foam type fire extinguisher.

Barges , Tugs, Launchs, etc. :

1 Launch 2 Barges 1 Ambulance.

Several cars, trucks and lorries available.

Floating Workshop : Have a floating Workshop equipped with a number of lathes drilling machines, Shaping machines, etc. from which all running repairs to inland steam and motor vessels are carried out.

SHIP REPAIRERS PRIVATE LIMITED

No drydocks, slipways or repair berths. Ship repair wor,k carried out at the berths or drydocks in the Port and Provide Mobile Units for Power compressed Air, etc. 1 Steel Barge of 50 tons capacity & several cars, lorries and trucks available.

EAST BENGAL ENGINEERING WORKS

Slipways : 1 slipway 650′ length.

Facilities at slipways : *Power* : 440 volts.

Compressed Air : One—100 c. ft. Air Compressor (Breonawade) 100 lbs./sq. in.

VISAKHAPATNAM

Port Administration

Floating Cranes, Water Barges :

One floating crane of 30 tons capacity Diesel driven non-propelling.

1 Floating crane 60 tons capacity, steam driven, non-propelling.

1 100-ton dumb water barge } with diesel pumps.
2 30-ton dumb water barges }

2 Launches.

Drydocks : One Drydock—Length 366 ft. Breadth 60 ft.

Maximum arrival draft of ship 12′ 6″ to 13′ 6″, according to tide.

Intended primarily for docking and repairs to Port Crafts only.

Repair Berths : No separate repair berth.

Facilities at Drydock : Fresh Water, Power, Compressed Air, Cranes and fire fighting equipment are available at the drydock.

Plans for Improvement Expansion :

No proposals by the Port for construction of drydock for merchant vessels. Deepening and lengthening of existing drydock considered necessary, as well as provision of lead-In-dolphin and installation of bigger pumps.

HINDUSTAN SHIPYARD PRIVATE LIMITED

No drydocks or repair berths. Presently not undertaking ship repairs work.

KAKINADA

With the Port

Drydocks : One Drydock—Lenth 165′ 0″ Breadth 35′ 0″

Sill Level -4·00 L.W. O.S.T.

Craft of 5′—0″ draft can be docked. Intended primarily for docking and repairs to port crafts.

Facilities in Drydock :—Fresh water, Power, Small Crane and Fire Fighting equipment available in the Drydock.

MADRAS

Madras Port Trust

Floating Cranes, Barges :

No floating cranes.

Two steel dump water barges for supply of water to ships.

G.R.T. .	21·5 Tons	and	32 Tons.
Length .	50′ 0″	,,	63′ 0″
Breadth .	14′ 0″	,,	16′ 0″
Depth .	5′ 6″	,,	5′ 6″
Capacity .	50 tons	,,	75 tons.

Drydocks :

No drydock.

Slipways :

One large slipway.

Length of slipway track	607 ft.
Width of cradle at Ends	23 ft.
,, ,, ,, at Middle	24 ft.
Length of cradle	221 ft.
Width of Slipway	68 ft.
Slope	1 in 20
Slipway track rails	3 Nos.
Hauling speed of centre winch	4 ft. per min with load
Capacity of centre winch	30 tons.
Capacity of two side winches	7 tons each

Capable of taking the Port Trust Dredger of 965 tons weight and other port craft.

Repair Berths : No repair berth.

Facilities of Slipways : No Fresh water available. Electric Power and compressed air available. No cranes or Fire Fighting equipment available.

Plans for Improvement Expansion : No drydock or repair berth contemplated.

BINNY'S ENGINEERING WORKS LTD.

No drydocks—repair berths or slipways available. Following available for work in stream.

One Wooden Barge, Several Steel Barges, one Motor Launch, Floating Diesel Welding Sets and Air Compressors.

CUDDALORE

With the Port :

DRYDOCK :—One Drydock 95 ft. length and 33 ft. breadth available for docking and repairs to Port dredger and craft only.

One water barge for supplying water and fuel to port dredger.

COCHIN

Port Administration.

Floating Cranes, Water Barges :

One floating crane (non-propelled) with One Luffing and Slewing Crane capable of lifting 5 tons and one fixed Jib Steam crane capable of lifting 30 tons mounted at the ends of a floating Dumb Barge.

	5 ton crane	30 ton crane
Maximum Radii	60′ 0″	45′ fixed jib
Minimum Radii	20′ 0″	45′
Height of hook above water level	85′ 0″	52′ 0″

3 Non propelled barges for water—2 of 100 tons capacity and one of 80 tons.

Drydocks :

One drydock 240′-0″ × 44′-0″ which can accommodate ships of 226′ length B.P. × 42′ Moulded Breadth, with a maximum draft of 13 ft. Almost exclusively used for docking and repairs to Port Barges, Launches, Dredger, etc.

Facilities at Drydock :

Water, Power, Compressed Air, Cranes and Fire Fighting equipments available at Drydock.

Repair Berth :

One alongside berth 200′ long near the drydock.

Plans for Improvement Expansion :

Construction of a drydock for large ships under tentative consideration depending on demands of the Navy, the Merchant Marine and the siting of the Second Shipbuilding Yard.

BRUMTON & COMPANY ENGINEERS LIMITED

Repair Berth : No repair berth but there water fronter which can take vessels upto a draft **of 15 ft.**

Slipways :—

One Slipway 120 ft. long, 30 ft. wide and several small slipways to accommodate small launches, barges etc.

Facilites on the Slipways and in the Workshop.

Fresh Water— available.
Power—available except in the Yard on Vypeen island where power available from a Generator.
Cranes—available in workshop.
Compressed Air — Available.
Fire Fighting appliances —Available including one portable Centrifugal Fire Pump.

Barges, Launches, Tugs, Etc:

2 Launches and 23 barges available—Equipped for repairs in stream.

KOZHIKODE

A small slipway capable of taking vessels of about 60 to 70 tons d.w.t. is under construction by the Port for use of port crafts only.

MANGALORE

With the Port

DRYDOCKS :

One drydock, length 110′ Breadth 48′ and maximum draft 8′, available for docking and repairs to barges, tugs and launches of the Port only. No slipways, repair berths or other facilities available. Power and water are available in the port.

BOMBAY

Bombay Port Trust

Floating Cranes, Two:

One F.C."Sarus"—G.R.T. 830·0—Capacity 60 tons on the main hoist at 40 ft. out reach and 15 tons on auxiliary block at an outreach of about 43 feet steam Operated, propelling.
One F.G.C.Flamengo—G.R.T. 342·8 capable of lifting 15 ton at 45 feet outreach-Steam Operated, propelling.

Barges, Tugs, Launches :

Water Barges two.
One steam Anchor Hoy "Panwel"—G.R.T., 342·14 tons, water capacity 120 tons—capable of pumping out 100 tons hour at 100 lbs Sq. in. One Motor water boat 'Nirmala'—GRT. 306·44 tons, water capacity 250 tons and capable of pumping out 120 tons hour at 100 lbs. Sq. in. A new Anchor Hoy with fresh water capacity of 250 tons in replacement of "Panwel" is planned.

4 trucks, 5 coal barges, 3 fluid cargo barges and one oily water barge, several timber boats of small sizes and several Hopper Barges.

16 launches of various sizes for harbour duties.

10 Dock Tugs and 9 Harbour Tugs.

Dry Docks : *Two*

Merewether Drydock : length 500 ft. Breadth 65′ 6″ Max. arriva Draft of ship 22 ft. on 14 ft. tide and max. beam of 61 ft.
Hughes Drydock : Length 1,000 ft. Breadth 100 ft. maximum arrival draft of ship 32 ft. on 14 ft. tide.

BOMBAY—*contd.*

Bombay Port Trust

The Hughes Drydock has provision for placing Caissons at either of the intermediate stops, so that the length of the two compartments can be (i) 425 ft. and 575 ft. or (ii) 500 ft. each or (iii) 575 ft. and 425 ft. respectively.

Slipways :

The Port Trust Workshops have six slipways. Maximum draft and Dead weight of craft which can be brought on them are 10 ft. and 300 tons respectively.

Facilities at Drydocks :

Fresh water supply is available at all berths and drydocks. 440 and 220 volts 50 cycles A. C. supply is available at the berths and Dry Docks. D.C. Supply upto 100kw @ 110/220 volts is available at the Merewether Drydock and 7 portable motor Generator sets of varying sizes are available with the Port for use of shipping which could be made available wherever required on application, subject to availability. Total capacity of these sets is 183 kw.

A 30 ton capacity electric crane is available at the Hughes Dry dock and Mobile Cranes upto 40 tons capacity can be made available at the dry docks and some berths.

At the Workshop slipways mobile crane can be brought for heavy lifts. One electrically driven and five diesel driven portable compressor sets, average capacity of each 200 cft./min are available for hire when not required for departmental work.

The port has an auxiliary Fire Brigade of its own and call upon the Municipal Fire Brigade as and when required. There are 2 fire fighting craft and several of the Port craft are equipped wih fire fighting equipment, both with water and foam. Hydrants are located all round the docks.

Plans for Expansion :

Under the Scheme of Modernisation of the Prince Dock and Victoria Docks, there was a proposal to provide an additional drydock but this was not approved by Government of India. There is also a proposal to extend the Hughes Dry dock southwards by 125 ft.

Repair Berths :

There are no repair berths as such in the Docks but very often berths K.L.M.N.O.P. & Q. at Prince Dock are allocated to ships undergoing repairs provided the same are not occupied by vessels for loading and unloading of cargo. At times, berths in Victoria Dock are also allotted. No special berths at the Wet Docks or at the Harbour Walls thereof have been allocated as berths specially reserved for vessels undergoing major surveys, repairs or overhaul. Until recently the sheds alongside certain berths in the Prince and Victoria Docks were under reconstruction and as the berths could not be utilised for the purposes of working cargos, to and from ships, they were given for vessels undergoing surveys, repairs or overhaul. Now that these sheds have been reconstructed and are fully in use for cargo operations, the berths are not given to ships undergoing repairs. When it is anticipated that a berth will remain vacant for some time, the opportunity is taken to utilise such a berth for the purpose of berthing vessels which require repairs, survey or overhaul.

Facilities at Repair berths :

At the berths used for ship repairs, electric supply and fresh water supply are available as well as the use of cargo handling cranes of capacity 30-35 cwt.

Plans for Expansion/Improvement:

No plans for construction of repair berths.

WITH PRIVATE SHIP REPAIRING FIRMS

Alcock Ashdown Company Ltd:

No drydocks or repair berths. There is a hard capable of building 4-100 ton vessels 5 feet launching draft. Repairs carried out in port berths or drydocks. 1 launch and several cars lorris etc., and portable generators, compressors, welding plants, pneumatic tools etc., available.

Scindia Workshop Private Ltd.

No drydock.
Slipway : One patent slipway Extreme Length 620′
Extreme Length of cradle 255′

Difference between High Water at ordinary springs and at ordinary neaps 6 feet Operated by a Haulting Engine of approximately 300 I.H.P. vessels upto 1200 G.R.T. with a maximum beam of 38 ft. and 8 ft. draft. Can be taken on the slipway *at suitable tides only.*

Facilitis at the Slipway :

Fresh Water : A 2″ fresh water pipe line connected to the Municipal main through booster pump of 7½ H.P. There are addition one motor driven pump for boosting fresh Municipal water. Two Special discharge valves along the slipway for supply of fresh water to ships on slipway.

Electric Power : Electric Power of 400 volts A.C. and 220 AC available. Two stationary Motor Generators and one Portable Electric Generator set for conversion of 440 volts AC into 110 volts D. C. available.

Cranage : Derrick at the head of the slipway of maximum lifting capacity 2 tons.

Compressed Air : A 4″ compressed air pipe line connected to four stand pipes with multiple connections on each fed by a stationary Electric Air Compressor delivering 462 cu. ft. per minute at 100 lbs. per sq. in. One portable electric compressor and six portable diesel compressors delivering 105 to 160 cu. ft. per minute at 100 lbs. per sq. in.

Fire Fighting Appliances :

There is an underground tank holding 100,000 gallons of sea water, with diesel driven pump of 200 lbs. per minute capacity at 200′ head near the tank. It feeds a 4″ fire fighting line along the slipway and other parts of workshop. Also a trailer pump of 7½ H.P. for building up pressure in Fire fighting line. A specially trained fire fighting squad available.

Repair Berths : No repaired berth. The small *tidal* repair berth at the eastern end of the slipway is capable of accommodating only small launches and barges upto a maximum length of 100 ft. and a draft of 4 ft. only.

Barges, Tugs, Launches :

Several cars, Trucks and Lorries available. 2 Jeeps with Trailers—one Electric For 2 passenger Launches of 90′ × 22′ × 6′-6″ lift G.R.T. 89·18.

56′-6″ × 10′-3″ × 5′=8″ G.R.T. 26·00

1 Coal Barge 95′=0″ × 22′-0″ × 6′-7″ 180 Tons capacity.

MAZAGON DOCK LIMITED

Drydocks

Ritchie Drydock	Extreme length	495′—0″
	Breadth at Entrance	66′—0″
	Depth at sill (Mean High Water Springs)	18′—0″
Mogul Drydock :	Extreme Length	426′—0″
	Breadth at Entrance	59′—9″
	Depth at sill (MHWS)	16′—0″
Mazagon Dock :	Extreme length	154′—0″
	Breadth at Entrance	34′—0″
	Depth over blocks (MHWS)	9′—0″

Slipways : Slipways are on the Foreshore of area known as North Yard. In all there are five slipways, three open and two under cover, served by an air driven winch. Small craft such as tugs, barges and launches upto 150 ft. in length can be hauled up for repairs. The Foreshore Boatshed and Slipway Cover an area of 82,789 sq. ft. and two Goliath type Cranes operate in the Boatshed over the covered slipways.

Facilities at Drydocks :

Ritchie Drydock :

Fresh water : Main supply line with discharge valves installed along side of drydock. A portable motor driven pump of 15 tons capacity is available for boosting the supply pressure, in addition to a 5 ton permanently installed air driven pump.

Electrical Power: Shore supply connections are available for 110 volts, 90 amps and 220 volts, 120 amps. Welding transformers each capable of taking three weldres are permanently installed on each side of the drydock.

Cranage: The Drydock is served by the Mobile Crawler-Type Crane capable of lifting a weight of 30 tons at a radius of 12 feet when operating with a short jib, and 10 tons at a 25 foot radius when operating with a long jib. Maximum radius 75 feet. In addition a 15 ton Steam Canc operates on rails along the length of the dry-dock.

Compressed Air. The 4" Dia. supply line fitted along both sides of the drydock has 19 branches for fitting manifolds and each manifold has 6 distribution pipes.

Fire Fighting Facilities. A Work's Fire-Brigade is maintained and fire-stations with trailer pumps are positioned strategically throughout the Yard. In addition a 6" dia. main is fitted along both sides of the drydock and pressure in this pipe line is maintained by a pump supplied from a large storage tank which in turn is supplied by a pump drawing water from the harbour. The Hydrants fitted to the fire-main allow 23 hose connections to be made in addition to portable pumps.

Oxy-Acetylene Supply: A liquid oxygen and dissolved acetylene plant is installed supplying piped oxygen and acetylene to the drydock.

Mogul Drydock :

Fresh water.—Main supply line with discharge valves installed along side of drydock A motor driven pump of 15 tons capacity is available for boosting the supply pressure if necessary.

Electrical Power.—Shore supply connections are available for 110 volts 200 amps and 220 volts 150 amps. Welding sets can be operated from a 440 volt 3 phase A.C. supply.

Cranage.—The Drydock is served by the Mobile Crawler Type Cranes capable of lifting a weight of 3 tons at a radius of 12 feet when operating with a short jib, and 10 tons at a 25 foot radius when operating with a long jib. Maximum radius 75 feet. In addition a 15 ton Steam crane operates on rails along the Cranes length of the drydock.

Compressed Air.—The 3" dia. supply line fitted along both sides of the drydock has 14 branches for fitting manifolds and each manifold has 6 distribution pipes. Two electrically drived compressors are permanently installed.

Fire Fighting.—A Work's Fire Brigade is maintained and Fire Stations with Trailer Pumps are positioned strategically throughout the Yard.

In addition a 6" dia main is fitted along both sides of the drydock and pressure in this pipe line is maintained by a pump drawing water from the harbour. Five Hydrants are fitted to the fire-main allowing hose connections to be made a various points.

Mazagon Drydock :

This small drydock is in close proximity to the Richie Drydock and the same facilities can be utilised.

Slipways.—North Yard Forehshore.

Fresh water.—Supply available by hose connections from the Ritchie Drydock water supply.

Electrical Power.—Shore supply connections are available for 110 volts 50 amps.

Welding transformrs are intalled capable of supplying current for 9 operators.

Cranage.—Two 'Goliath' Cranes are available for the covered Slipways in addition to the Yard's mobile Cranes.

Compressed Air.—An air-receiver supplied from the main system is installed for supply of air to the Slipways.

Fire Fighting.—A Work's Fire Station is adjacent to the covered slipways and, in addition to the trailer pump, a salt-water Hydrant is in close proximity.

Oxy-Acetylene Supply.—Similar facilities as at drydocks.

Barges, Launches, Tugs :

Barges.—Coal Barge—One 60′×17·58′×7.″

General purpose Barge—One—105′—75″×25′-14″×8-33′ GRT 171·69.

(Licensed for the carriage of Petroleum in Bulk by water and also used for carrying generators, compressors, etc.)

Launch.—Passengers Launch—One 49·4′×12·92′× 5·42′. Capacity 36 persons (used to convey personnel to vessels in stream).

Mooring Launches—Two—36′-0″ long—Capacity 25 persons—Used for conveying workmen to ships in stream.

Tugs.—Steam tugs—two (*i*) 112·4′×24′×12·25′ G.R.T. 225·25.

Machinery Two Triple Expansion Engines 1000 I.H.P. Speed 10 knots. 1 No. (*ii*) 96·5′17′×8′ registered to carry 60 passengers—

Machinery.—Two Compound Engines 320 I.H.P. Speed 10 knots.

(*iii*) Steam tug and water boat G.R.T. 126·70 Registered Dimensions.

90′×20·25′×9′ registered to carry 120 passengers.

Capacity of fresh water 130 tons.

Machinery—Single Compound Engine 200 I.H.P. speed 8 knots.

(*iv*) Steam tug and Water Boat, G.R.T. 192·54, dimensions 110·75′×23′×8·25′ Registered to carry 250 passengers. Fresh Water Capacity 120 tons.

Machinery : Two Compound Engines 336 I.H.P. Speed 10½ knots. 1 No.

Dredging Craft (*i*) Steam operated Pantoon Grab Dredger.

Dimensions 51·3′×22′×5·8′.

(*ii*) One Dumb Hopper Barge G.R.T. 46·19 Dimensions 87′×19×8·2′ and

(*iii*) one Dumb Hopper Barge G.R.T. 46·19 Dimensions 70′×18′×8′.

SAURASHTRA PORTS :

Port Authorities

सत्यमेव जयते

DRYDOCKS :

Port	Length	Breadth	Clear entrance width	Gate		Remarks
				Height	Sill Level	
BHAVNAGAR						
Drydock .	249′·6″	53′·0″	40′·0″	17′·0″	+22·83 R.L.	Mean High Water neap is 28.1. Mean High Water Spring is 34·6. High Spring Tide is +39. Composite gates Semi circular in two parts. Gates handled by a 5 ton Electric Crane fixed on one side of drydock.

Port	Length	Breadth Width	Clear Entrance Width	Gate		Remarks
				Sill Level		
Barge Basin	195'·0"	214'·0"	34'·0"	16'·0'	+25	R.L. Structural Steel Gates parabolic Arch. Cassion type operated by 3 ton steam drane fixed one side Constructed 1956.
VERAVAL						
Drydock	135'·0"	180'·0"	35'·0"	16·0"	+77	R.L. Composite gate in one part flat type. A 20 ton steam crane is provided to handle the Gate.
BEDI BUNDER						
Drydock	230'·0"	53'·6"	44'·0"	10'·0"	+103	H.L. Hights Water of spring tide is 112 R.L. Composite gates in two parts, parabolic arch operated by 3 ton steam crane fixed on one side near entrance. Constructed 1953.
Barge Basin	250'·0"	50'·0"	22'·0"	10'·0"	+103	R.L. Structural Steel gates Parabolic arch, hinged at bottom, flat type. Operated by two 5 ton hand winches fixed on each side near entrance Constructed 1953.

Facilities at Drydocks :

Water and Electric supply are available at the Drydocks. In Bhavnagar a 5 ton electric crane, in Bedi Bunder at 3 ton steam crane and in Veraval a 20 ton steam crane are available near the drydocks. Fire fighting arrangement's exist at all these Ports. For compressed air the ports supply portable air Compressor Units.

Slipways.—There are several small slipways or Hards construction or repairs to sailing vessels an other small crafts at different Saurashtra ports.

Repair Berths.—There are no repair berths at any Port.

Targes, Tugs, Launches etc.—No floating crane at any port. 3 water barges are of 80 tons carrying capacity at Bhavnagar, Bedibunder and Navlakhi.

Several cargo carrying barges both of wood and steel and several tugs for towing the barges available in varying numbers at the Ports of Bhavnagar, Bedi Bunder, Veraval, Porbandar and Okha.

Plans for Improvement/Expansion.—

(*a*) A drydock at Porbandar of proposed dimensions 250'×55' with clear entrance opening of 40 ft. and sill level of 2', so that ordinarily with high tide, vessels of 8 ft. draft can be docked—is provided in Second Five Year Plan.

(*b*) A drydock at Okha of length 270 ft. width 55 ft. with clear width of the Gate 40 ft. and Sill level at the Gate —2 ft., so that ordinarily vessels of 11 ft. draft can be docked, is under consideration.

(*c*) A lock gate at the entrance at the concrete jetty at Bhavnagar is under construction to provide a Wet Dock Basin with cargo berths for vessels with deep drafts. Proposals are under consideration for allocating a newly created berth in the basin for carrying out ship repairs.

Kandla

Port Authorities

Drydocks.—One Floating dock :—

Outside measurements 264 ft. length, 64 ft. width., 24 ft. deep. Inside measurements 264 ft length, 49 ft. width, 16 ft. deep. Can accommodate vessels in the dock of 225 ft. length 35 ft. beam, 11 ft. draft and not more than 800 tons.

Not suitable for docking large merchant vessels.

Used for docking and repairs of port craft only.

Slipways— repair Berths.—No slipways or repair berths.

Facilities at Drydock.—Fresh water supply can be arranged from Shore.

Power leads from shore. Compressed air available.

Plans for improvement/Expansion.—No plans for drydock or repair berths.

Barges, Launches, Tugs.—One water Barge with 90 tons capacity provided with a Diesel Driven pump to supply water to Ships.

सत्यमेव जयते

ANNEXURE VII

List of Sub-Contractors.

Cleaning chipping and painting work.

1. Abdul Bari, 50 Watgunge street, Calcutta—23.
2. Bomanji Dhunjibhoy Private Limited, North Yard, Mazagon Dock (P) Ltd. Bombay—10.
3. D. H. Dhunjibhoy, Horniman Circle, Bombay—1.
4. R. H. Dhunjibhoy, C/o. James Mackintosh & Company, Darabshaw Building, Ballard Estate, Bombay—1.
5. Maneckji & Jamshedji, 34 A, Ambawadi, Gunpowder Road, Bombay—10.
6. Davur Industries, 37, Frere Road, Bombay—9.
7. Eastern Bunkerers Private Limited, " Scindia House", Dougall Road, Ballard Estate, Bombay—1.

Repairs to radio and radio Navigational aids

1. Marconi International Marine Communications Limited, 32 Nichol Road Calcutta.
2. E. W. Stevens & Company Limited, 22 Chowringhee Road, Calcutta.
3. Techlab, 29 Ritherdon Road, Madras—7.

Refrigeration repairs

1. Detroit Refrigeration Company Limited, 109, S. N. Banerjee Road, Calcutta—13.
2. Radiocrafters, 21 C. D. Queens Road, Bombay—4.
3. Calcutta Bombay Trading Corporation, 6 Brabourne Stadium House, Bombay—1.
4. Freezall, ' Kisanmahal, Tribhuvan Road, Bombay—4.
5. Star Freeze, ' Parijat ', Netaji Subash Road, Bombay—2.

Insulation work

1. Scott Pickstock Private Limited, 5 Fairlie Place, Calcutta.
2. Insulation Engineers Limited, 4 Lyons Range, Calcutta.
3. Asbestos Magnesia & Friction Materials Limited, Agra Road, Bombay.

Furnishing

1. Spencer & Company Limited, Mount Road, Madras—2.

Miscellaneous

1. J. D. Jones & Company, Vir Nariman Road, Bombay—1.
2. H. A. Sethi, 17, Main Road, Perambur.
3. T. Joseph, Srinivasanagar, Chetpet, Madras—31.

ANNEXURE VIII

Statement showing particulars of Indian owned tonnage as on 31st March—1959

I—*Coastal Trade*

No.	Name of the Co.	Sl. No.	Name of vessel	Year of build	GRT	DWT	GRT	DWT	Remarks
					As on 31-3-59		As on 28-2-59		
1	2	3	4	5	6	7	8	9	10
1	*The Scindia Steam Nav. Co. Ltd. Bombay.*								
		1.	s. s. Jalayamuna .	1936	4,981	8,046			*Passenger-*cum* cargo vessels. (*d*) denotes the vessel is mortgaged to Govt. as security.
		2.	m.v. Sonavati* .	1936	1,638	2,402			
		3.	s.s. Jalakrishna .	1937	4,991	8,046			
		4.	s.s. Jalajyoti(*d*) .	1943	5,975	8,755			
		5.	s.s. Jalamayur(*d*) .	1943	7,209	10,804			
		6.	s.s. Jalarajan(*d*) .	1946	5,085	8,020			
		7.	s.s. Jalausha .	1948	5,102	8,050			
		8.	s.s. Jalaprabha (*d*) .	1949	5,103	8,050			
		9.	s.s. Jalaprakash .	1949	5,098	8,010			
		10.	s.s. Jalapankhi(*d*) .	1950	5,100	8,022			
		11.	s.s. Jalapadma (*d*)	1951	5,104	8,009			
		12.	s.s. Jalapalaka (*d*)	1951	5,104	8,013			
		13.	s.s. Jalapratap (*d*) .	1952	5,103	7,997			
		14.	s.s. Jalapushpa (*d*) .	1952	5,130	7,960			
		15.	s.s. Jalamani .	1953	5,023	8,865			
		16.	s.s. Jalaputra (*d*) .	1954	5,172	7,986			
					80,918	127,035	80,918	127,035	

1	2	3	4	5	6	7	8	9	10
2	*The Scindia Steam Nav. Co. Ltd. Bombay (B.S.N. Line)*								
		17.	s.s. Bhadravati* .	1932	1,449	1,477			*Passenger-*cum*-cargo vessels.
		18.	s.s. Jalatarang .	1944	1,917	3,090			
		19.	s.s. Jalabala .	1946	1,208	1,714			
		20.	s.s. Saraswati* .	1949	3,750	3,695			
		21.	m.v. Jalatapi .	1956	2,671	3,273			
		22.	s.s. Sabarmati* .	1949	3,750	3,715			
					14,745	16,964	14,745	16,964	
3	*The Bombay Steam Nav. Co. (1953) Ltd. Bombay*								
		23.	s.s. Hiravati** .	1930	580	277			**Purely passenger vessels, Konkan service.
		24.	s.s. Chandravati** .	1933	556	252			
		25.	s.s. Ratnagiri** .	1935	590	316			
		26.	m.v. St. Anthony**	1936	452	172			
		27.	s.s. Champavati**	1949	1,288	241			
		28.	s.s. Rohidas** .	1949	1,288	241			
					4,754	1,499	4,754	1,499	
4	*The Bharat Line Ltd., Bombay.*								
		29.	s.s. Bharatraja	1942	7,132	10,372			(d) Denotes the vessel is mortgaged to Govt. as security.
		30.	s.s. Bharatrani .	1942	7,126	10,372			
		31.	s.s. Bharatkhand .	1943	2,905	4,380			
		32.	s.s. Bharatveer .	1943	7,274	10,530			
		33.	s.s. Bharatlaxmi(*d*) .	1944	1,541	1,250			
		34.	s.s. Bharatvijaya .	1949	5,977	8,755			

	35. s.s. Bharatmitra	1951	5,104	8,006		
	36. s.s. Bharatratna(d) .	1954	5,172	7,960		
			42,231	61,625	42,231	61,625
5	*The Great Eastern Shipping Co Ltd., Bombay*					
	37. s.s. Jag Devi .	1943	5,998	8,710		
	38. s.s. Jagjanani (*d*) .	1944	6,140	8,960		
	39. m.v. Jagganga (*d*)	1951	1,527	2,008		
	40. m.v. Jagjamna (*d*) .	1951	1,527	2,008		
	41. s.s. Jagrani(*d*) .	1952	5,103	8,010		
	42 s.s. Jagtara (*d*)	1954	3,982	7,000		
	43. m.t. Jagjyoti (Tanker) (*d*) .	1948	8,208	13,125		
	44. s.s. Jag Sewak .	1940	4,873	8,970		
			37,358	58,791	37,358	58,791
6	*The Western Shipping Corp. Ltd., Bombay*					
	45. s.t. Desh Sewak .	1950	7,363	10,172	7,363	10,172
7	*Shri Ambica Steam Nav. Co. Ltd., Bombay*					
	46. s.s. Asha .	1928	1,552	1,182	1,552	1,182
8	*The Malabar Steamship Co. Ltd., Bombay*					
	47. s.s. Jagdamba (*d*) .	1933	1,416	2,470		
	48. s.s. Janeta (*d*)	1941	5,536	9,780		
	49. s.s. Janani(*d*) .	1947	4,221	7,490		
	50. s.s. Januda (*d*)	1948	4,953	8,910		
	51. m.v. Janaki (*d*)	1958	1,160	1,742		
	52. m.v. Jhanvi (*d*) .	1958	1,161	1,740		
			18,447	32,132	18,447	32,132

1	2	3	4	5	6	7	8	9	10
9	*The New Dholera Steamships Ltd., Bombay*								
		53.	s.s. Jayhind (*d*)	1923	1,374	2,170			
		54.	s.s. Jayshoor (*d*)	1941	5,970	8,800			
					7,344	10,970	7,344	10,970	
10	*The National Steamship Co Ltd., Bombay*								
		55.	s.s. Jyoti (*d*) .	1949	1,355	2,480	1,355	2,480	
11	*The Merchant Steam Nav. Co. Ltd., Bombay*								
		56.	s.s. Sagarlaxmi .	1926	1,895	3,565			
		57.	s.s. Sagarprabha .	1932	1,413	2,650			
					3,308	6,215	3,308	6,215	
12	*The Africana Co. Ltd., Bombay*								
		58.	s.s. Victoria Marie	1927	1,432	2,291			
		59.	s.s. Sagar Veena(*d*) .	1936	983	1,400			
		60.	s.s. Sagarrani(*d*) .	1950	1,573	3,185			
					3,988	6,876	3,988	6,876	
13	*The Chandbali Steamer Service Co Ltd., Calcutta*								
		61.	s.s. Ramaraja .	1912	783	985			
		62.	s.s. Ramakrishna(*d*)	1943	1,791	2,000			
					2,574	2,985	2,574	2,985	

14. *The South East Asia Shipping Co. Ltd., Bombay*							
	63. s.s. Mahakhursheed(*d*)	1921	1,050	1,570			
	64. s.s. Maharashmi(*d*)	1943	1,791	2,820			
			2,841	4,390	2,841	4,390	
15. *The Indian National Steamship Co. Ltd., Calcutta*	56. s.s. Sivaratna	1921	983	1,480	983	1,480	
16. *The Southern Railway*							
	66. s.s. Irwin@	1929	970	485			@Purely passenger vessel.
	67. s.s. Goschen@	1929	970	485			
			1940	970	1,940	970	
17. *The India S.S. Co. Ltd., Calcutta*	68. s.s. Indian Commerce (*d*)	1950	2,124	3,700			
18. *The Hindustan S. Co., Ltd., Calcutta*							
	69. s.s. Savitri	1925	368	500			
	70. s.s. Neelambu	1943	473	490			
19. *The Akooji Jadwat & Co. Ltd., Andamans*	71. M.V. Safeena	1952	208	300			
20. *The Brunton & Co. (Engg.) Ltd., Cochin.*	72. m.v. Asoka	1949	184	..			
21. *The Gill Amin & Co. Ltd., Bombay.*							
	73. s.s. Sheila Margaret (*d*)	1944	682	700			
	74. s.s. Margaret Rose	1945	567	500			
	75. s.s. Trio	1929	1,146	1,050			
22. *M/s. Bhogilal Muljibhai Co. Bombay*	76. m.v. Mira	1940	189	..			
23. *Smt. Mahalaxmi Bhogilal*	77. m.v. Krishna	1940	181	..			

1	2	3	4	5	6	7	8	9	10
24.	*M/s. Bengal Line Ltd., Calcutta.*								
		78.	s.s. Rayandamans	1922	2,256	3,500			
25.	*The Meridian Steamship Co. Ltd., Cochin*								
		79.	s.s. Kilfenora	1920	979	1,200			
26.	*The Ambassador Steamship Co. Ltd., Cochin*								
		80.	s.s. Effigyny	1934	871				
27.	*Govt. of India (Ministry of H.A.)*								
		81.	m.v. Nicobar*	1949	2,238	2,356			*Passenger-cum-cargo vessels.
		82.	m.v. Andamans*	1957	5,934	4,060			
					18,400	18,356	18,400	18,356	
	GRAND TOTAL				2,50,101	3,64,172	2,50,101	3,64,172	

Abstract

	As on 31-3-59			As on 28-2-59		
	No. of ships	G.R.T.	D.W.T.	No. of ships	G.R.T.	D.W.T.
Dry cargo	80	2,34,530	3,40,875	80	2,34,530	3,40,875
Tanker	2	15,571	23,297	2	15,571	23,297
	82	2,50,101	3,64,172	82	2,50,101	3,64,172

Statement showing particulars of Indian owned Tonnage as on the 31st March 1959.

II.—*Overseas Trade*

No.	Name of the Co.	Serial No.	Name of the vessel	Year of build	GRT As on 31-3-1959	DWT As on 31-3-1959	GRT As on 28-2-59	DWT As on 28-2-59	Remarks
1	2	3	4	5	6	7	8	9	10
1	*The Scindia Steam Nav. Co. Ltd., Bombay*								
		1.	s.s. Jalamoti	1942	7,133	10,384			India/UK/Continental trade.
		2.	s.s. Jalakala(*d*)	1943	7,271	10,847			
		3.	s.s. Jalavallabh	1950	6,893	9,350			
		4.	s.s. Jalarajendra(*d*)	1951	6,893	9,350			
		5.	s.s. Jalagovind (*d*)	1953	5,342	9,150			
		6.	m.v. Jalazad (*d*)	1955	6,199	9,501			
		7.	m.v. Jalajawahar (*d*)	1955	6,199	9,525			
		8.	m.v. Jaladharma(*d*)	1957	6,527	9,535			
		9.	m.v. Jaladhir (*d*)	1957	6,527	9,535			
		10.	m.v. Jaladhanya(*d*)	1957	6,527	9,500			
		11.	s.s. Jalamudra (ex Hallindene)	1952	4,928	8,890			
		12.	s.s. Jalamatasya (ex Exedene)	1951	4,908	8,890			
		13.	m.v. Jalaveera	1958	4,584	7,134			
		14.	m.v. Jalavishnu	1956	4,584	7,207			India/West Africa trade.
		15.	m.v. Jalavijaya	1955	4,600	7,196			
		16.	m.v. Jalavihar	1955	4,650	7,134			
		17.	s.s. Jalaketu (*d*)	1944	7,180	10,800			India/USSR Service.
		18.	s.s. Jalakanta	1943	7,180	10,909			
		19.	s.s. Jalakendra	1943	7,180	10,639			
		20.	s.s. Jalamanjari	1944	7,211	10,976			
		21.	m.v. Jaladhan (*d*)	1956	6,527	9,515			India/U.S.A. Service.
		22.	m.v. Jaladharati(*d*)	1957	6,527	9,500			
		23.	m.v. Jaladhruv (*d*)	1956	6,527	9,551			
		24.	s.s. Jalamohan (*d*)	1941	5,969	8,800			India/USSR Service.
					1,48,066	2,23,818	1,48,066	2,23,818	

1	2	3	4	5	6	7	8	9	10
2.	*The India Steamship Co. Ltd., Calcutta.*								
		25.	s.s. Indian Merchant(*d*)	1944	7,659	10,636			India/UK/Continental trade.
		26.	s.s. Indian Navigator(*d*)	1944	7,612	10,719			
		27.	s.s. Indian Pioneer(*d*)	1944	7,657	10,772			
		28.	s.s. Indian Shipper(*d*)	1944	7,660	10,757			
		29.	s.s. Indian Trader(*d*)	1944	7,657	10,678			
		30.	s.s. Indian Exporter(*d*)	1945	7,659	10,626			
		31.	s.s. Indian Reliance(*d*)	1955	7,425	10,138			
		32.	s.s. Indian Renown(*d*)	1955	7,422	10,138			
		33.	s.s. Indian Resolve(*d*)	1956	9,775	11,415			
		34.	s.s. Indian Resource(*d*)	1956	9,775	11,415			
		35.	s.s. Indian Splendour (*d*)	1957	9,409	12,090			
		36.	s.s. Indian Security(*d*)	1958	9,300	12,070			
		37.	s.s. Indian Endeavour (*d*)	1945	7,306	10,180			India/USSR trade
		38.	s.s. Indian Success	1958	9,458	12,245			India/S. America.
		39.	s.s. Indian Strength	1959	9,415	12,513			India/U.K.
					1,25,189	1,66,392	1,25,189	1,66,392	
3.	*The Kamal Shipping Co. Ltd., Bombay*								
		40.	s.s. Jalakanya	1943	7,180	10,650			India/U.K. Continental trade.
		41.	m.v. Jalavikram	1958	4,584	7,134			India/West Africa.
					11,764	17,784	11,764	17,784	

4.	*The Eastern Shipping Corporation Ltd., Bombay.*						
42.	s.s. State of Saurashtra	1944	7,217	0 310			India/Australia.
43.	m.v. State of Kutch	1956	5,600	8 000			
44.	m.v. State of Orissa	1957	5,266	8,039			
45.	s.s. Sate of West Bengal	1944	7,216	10,310			India/Japan/Far East.
46.	m.v. State of Andhra	1947	4,509	7,700			
47.	State of Travancore Cochin	1954	6,250	9,642			
48.	s.s. State of Bombay(*d*)	1948	8,521	10,310			India/East Africa.
49.	s.s. State of Madras(*d*)	1948	8,580	10,310			India/Malaya.
			53,159	74,621	53,159	74,621	
5.	*The Malabar Steamship Co. Ltd., Bombay.*						
50.	s.s. Janmada	1943	7,162	10,490	7,162	10,490	India/U.K./Cont.
6.	*The Bharat Line Ltd., Bombay.*						
51.	s.s. Bharatdeepak(*d*)	1947	2,631	4,330			India/Persian Gulf trade.
52.	s.s. Bharatbhushan(*d*)	1947	4,882	8,910			
53.	s.s. Bharatkesari(*d*)	1948	2,348	3,780			
			9,861	17,020	9,861	17,020	
7.	*The Great Eastern Shippping Co. Ltd., Bombay.*						
54.	s.s. Jag Mata (ex. Twickenham)	1940	4,904	8,910			Tramp Trade.
55.	m.v. Jag Laadki(*d*)	1942	7,268	10,200			
56.	s.s. Jagvijay (*d*)	1942	7,125	10,615			
57.	s.s. Jagshanti (*d*)	1941	6,331	9,395			
58.	s.s. Jag Doot (ex. Caledonian Monarch)	1948	6,979	10,037			
59.	m.v. Jag Laxmi(*d*)	1957	8,797	12,970			
			41,404	62,127	41,404	62,127	
	GRAND TOTAL		3,96,605	5,72,252	3,96,605	5,72,252	

सत्यमेव जयते

Abstract

		As on 31-3-1953			As on 28-2-1959		
		No.of ships	G.R.T.	D.W.T.	No. of ships	G.R.T.	D.W.T.
	Dry Cargo . .	59	3,96,605	5,72,252	59	3,96,605	5,72,252
Coastal:—							
	Dry cargo . .	80	2,34,530	3,40,875	80	2,34,530	3,40,875
	Tanker . .	2	15,571	15,571	2	15,571	23,297
	2,50,101	82	3,64,172	82	2,50,101		
Overseas :—							
	India/UK/Continent	28	2,02,698	2,86,698	28	2,02,698	2,86,698
	India/Persian Gulf .	3	9,861	17,020	3	9,861	17,020
	India/Australia .	3	18,083	26,349	3	18,083	26,349
	India/Japan/Far East	3	17,975	27,652	3	17,975	27,652
	India/Singapore .	1	8,580	10,310	1	8,580	10,310
	India/East Africa	1	8,521	10,310	1	8,521	10,310
	India/USSR .	5	34,846	51,504	5	34,846	51,504
	India/West Africa .	5	25,598	39,471	5	28,598	39,471
	India/U.S.A .	3	19,581	28,566	3	19,581	28,566
	Tramp trade .	6	41,404	62,127	6	41,404	62,127
	India/South America	1	9,458	12,245	1	9,458	12,245
		59	3,96,605	5,72,252	59	3,00,605	5,72,252
	GRAND TOTAL .	141	6,46,706	9,36,424	141	6,46,706	9,36,424

NOTE.—This does not include 8 small vessels of 1803 G.R.T. which are employed in inland waters.

STATEMENT III

Statement showing particulars of Tonnage acquired by Indian shipping Companies during the month of March, 1959

Sl. No.	Name of the Co.	Sl. No.	Name of the vessel	Year build	GRT	DWT	Trade in which employed	Remarks
				NIL				

STATEMENT IV

Statement showing particulars of Indian owned Tonnage sold or scrapped during March, 1959

Sl. No.	Name of the Co.	Sl. No.	Name of the vessel	Year of build	GRT	DWT	Trades in which employed	Remarks
					NIL			

ANNEXURE IX

Statement showing the names of firms engaged in ship building and ship repair industry registered with the Development Wing for allotment of steel quotas, their assessed capacity and allotment made.

	Name of the firm	Assessed capacity	All figures are in tons per quarter. Allotment for period I 57—58	II 57—58	III 57—58	IV 57—58	I 58—59	II 58—59	III 58—59
1	Shalimar Works, Ltd.	250	250	150	250	200	213	15	59
2	Port Engg. Works	170	170	Nil.	81	Nil.	62	Nil.	170
3	Hooghly Docking and Engg. Co. Ltd.,	275	275	167	50	38	234	60	263
4	Coomar Docking & Engg.	60	Nil.	60	60	60	51	36	60
5	Peoples Engg. & Motor Co	50	50	50	Nil.	50	43	Nil.	50
6	Sen Mukerjee & Co.	60	Nil.	Nil.	Nil.	Nil.	Nil.	50	120
7	Ganges Engg. Works	30	30	30	30	30	26	24	30
8	Garden Reach Workshop	640	1000	600	600	600	544	488	600
9	India General Navigation Co.	450	450	396	150	95	383	43	67
10	East Bengal Engg. Works	75	75	75	75	75	Nil.	66	74
11	Mazgaon Dock (P) Ltd.	425	425	360	340	290	315	237	296
12	Alcock, Ashdown & Co.	400	400	400	400	400	340	324	400
13	Scindia Workshop (P) Ltd.	225	225	180	180	180	191	169	225
14	H.I. Dixon & Co.	75	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.
15	Shaparia Dock & Steel	65	65	65	65	65	65	57	65

16	B. R. Herman & Mohatta	30	Nil.	Nil.	Nil.	Nil.	Nil.	25	30
17	Binnys Engineering Works . . .	30	30	30	30	30	26	27	30
18	Brunton & Co. Engineers	25	Nil.	Nil.	Nil.	Nil.	5	20	9
19	AFCO Ltd.	—	—	119	90	119	125	55	Nil.

GMGIPND—IS—58 M. of TC—31-8-59—500